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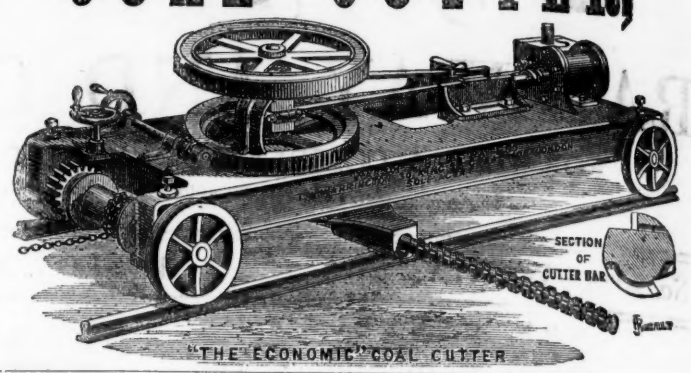

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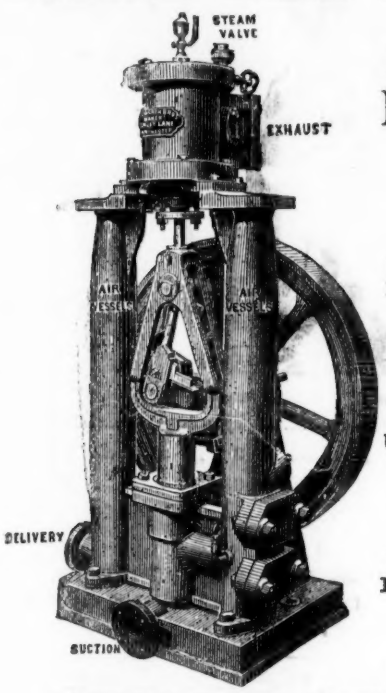

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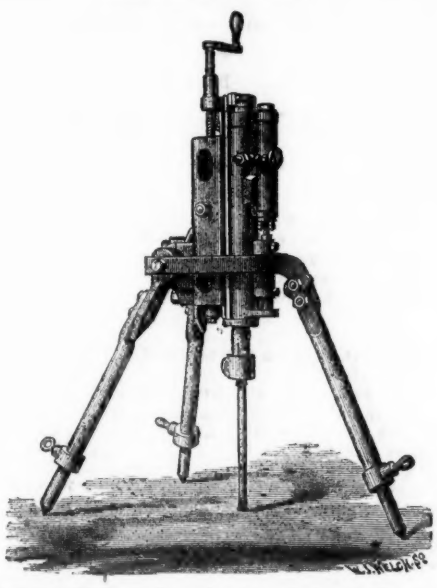

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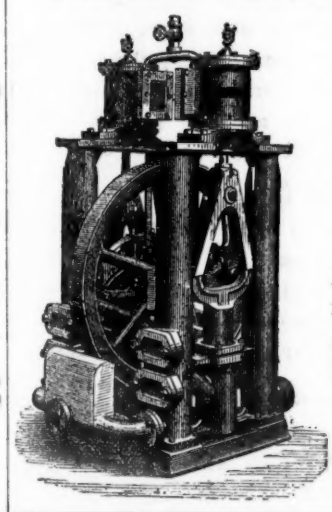

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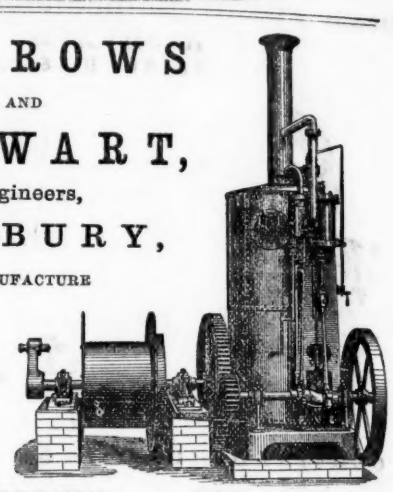

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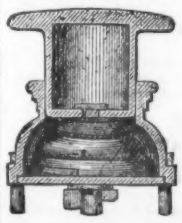

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THE IRON INDUSTRIES OF SHROPSHIRE.

By RICHARD MEADE, Assistant Keeper of Mining Records, Museum of Practical Geology.

The coal deposits of Shropshire are not found to exist in one continuous unbroken area, like those of the Great Midland Coal Fields of Derbyshire and Yorkshire; but rather in several detached tracts or areas, all referable geologically to the same age. Of these, the most important is the coal field of Coalbrookdale; the others are those of Shrewsbury, Oswestry, the Clee Hills, and the Forest of Wyre, which last is partly situated in the adjoining counties of Stafford and Worcester. The Coalbrookdale Field lies between the important towns of Wenlock, Wellington, and Lilleshall, extending over an area of 28 square miles, the greatest thickness of coal-measures amounting to 1200 feet, in which numerous seams of coal occur; the aggregate thickness of those seams (six in number, each of which exceeds 2 ft. thick) gives a vertical section of 27 ft. of solid coal. It is observable that in passing from the north to the south of this coal field the thickness of the measures and the seams of coal diminishes considerably. The Shrewsbury coal field is of less extent, and extends in a narrow band from the base of Haughmond Hill, east of Shrewsbury, to the River Severn, near Alberbury, a distance of 18 miles, while its greatest width in any place does not exceed one mile. In the lower part of the measures there are two or three coal seams worked, but only to a limited extent. The other areas of Oswestry, Clee Hills, and the Forest of Wyre possess workable seams of coal, but their production is not very considerable.

PRODUCTION OF COAL.—The following statement of the number of collieries and quantities of coal raised in Shropshire in each of the years since 1854 will exhibit the resources of the district as a coal-producing area:—

Year.	No. of collieries.	Coal.	Year.	No. of collieries.	Coal.
1854	48	Tons 1,080,000	1869	59	Tons 1,392,862
1859	59	765,000	1870	59	1,343,300
1863	66	1,150,000	1871	59	1,350,000
1868	64	1,495,500	1873	60	1,570,000

An examination of the above-named quantities shows that since the year 1854 the increase in the output of the collieries of Shropshire is upwards of 50 per cent. In the year 1873 Shropshire contributed 1¼ per cent. of the total output of the 3527 collieries in the United Kingdom, which produced in the same year 127,016,747 tons.

IRONSTONE DEPOSITS.—As previously stated, the greatest thickness of coal measures in the area does not exceed 400 yards; in the lower 100 yards of which the principal seams of coal and measures of ironstone occur, the following being the more important of the latter. The "Top" or "Chance Pennystone," a deposit characterised by much irregularity, but possessing a strong resemblance to the main Pennystone, which lies some 70 yards lower. One of the most interesting features in the Shropshire ironstones is the great variety of fossil remains preserved in the interior of the nodules, exceeding in this respect those of most other districts. The "Ragged Robin" is another irregular seam. The "Blackstone" measure, an ironstone of dull lustre and irregular fracture, is highly valued in the district as one of the materials for making the "best-best" cold-blast iron; this seam yields 1500 tons per acre. The next measure occurring is the "Brick," an ironstone of secondary importance, existing in the form of flat cakes of a rich brown, with their surface very smooth, and of a chocolate colour, while a lower measure, the "Ballstone," possesses a brownish grey colour, and when broken gives a conchoidal fracture; like the "Blackstone," it is extensively used in the make of the best cold-blast iron. "Yellowstone" measure, next occurring, is in lumpy irregular nodules, with white powdery spots, yielding where well developed 1200 tons to the acre, and used alike for both hot and cold blast iron. The "Blue Flat" measure is irregular in its occurrence, the nodules are of a brownish grey colour, and exist interstratified with an indurated clay, yielding to the acre about 1600 tons of ironstone. The "White Flats"—the nodules of this measures are of a brownish grey colour, and the yield per acre is about 1500 tons—next occurs. The "Pennystone" measure, a series of nodules, yielding where well developed from 2200 to 2300 tons per acre; this measure, however, is found to thin out in its passage to the southern part of the coal field. The "Crawstone," the lowest ironstone measure in the series, was formerly worked in the southern part of the coal field, but is no longer wrought to any considerable extent. The production of the ironstone measures of Shropshire during the past 10 years shows steady progress, which will be observed from the following statement:—

Year.	Ironstone.	Year.	Ironstone.
1864	Tons 254,590	1869	Tons 318,483
1865	273,810	1870	337,627
1866	285,907	1871	415,972
1867	250,000	1872	408,425
1868	278,541	1873	430,725

For the last-named year, 1873, it will be well to give the detailed production of the various districts and values from returns received by the Mining Record Office:—

District.	Ironstone.	Value.
Coalbrookdale	Tons 23,026	£ 13,816
Dawley	35,679	21,407
Ketley	9,014	5,408
Lilleshall	102,530	61,518
Madeley Court	21,414	12,848
Old Park	10,828	6,497
Wombridge	8,234	4,941
Sundry mines	220,000	120,000
Total	Tons 430,725	£246,435

The total production of iron ore and stone in the United Kingdom in the year 1873 amounted to 15,577,499 tons, and of this quantity the measures of Shropshire contributed more than 2¾ per cent. With this brief sketch of the principal measures of ironstone, the next point to consider is their composition.

ANALYSES OF IRONSTONE.—In the "Memoirs of the Geological Survey of Great Britain," Part IV., will be found a description of the Iron Ores of the Shropshire Coal Field, by Prof. W. W. Smyth, F.R.S., and a series of analyses, made in the Royal School of Mines, in Dr. Percy's laboratory, by Mr. John Spiller, in which the ironstones are generally described as follows. To this Memoir we are indebted for many of the facts contained in this notice:—"Description: Clay ironstone, easily scratched by a steel point; colour dark grey, fracture sub-conchoidal, structure minutely crystalline." This specimen contains a small quantity of white clay distributed in the cavities of contraction.

Results tabulated.

Protoxide of iron	48·28
Protoxide of manganese	·82
Alumina	·67
Lime	3·26
Magnesia	1·83
Carbonic acid	32·98
Phosphoric acid	·26
Sulphuric acid	·10
Bisulphide of iron	·19
Water, hygroscopic	·24
Water, combined	·62
Organic matter	·62
Ignited insoluble residue	11·19
Total	100·06

The amount of metallic iron contained in this sample of "Black Flats" ironstone amounted to 37·92 per cent. The following statement shows generally the proportion of protoxide of iron, carbonic acid, and metallic iron contained in each ironstone of the district examined:—

Ironstone measures.	District.	Protoxide of iron.	Carbonic acid.	Metallic iron.
Black Flats	Donnington Wood	48·28	32·98	37·92
White Flats	Ditto.	44·33	30·92	35·61
Blue Flats	Ditto.	46·30	31·68	36·49
Pennystone	Ditto.	45·08	34·04	35·63
Pennystone	Ditto.	38·55	29·80	30·40
Pennystone	Madeley Court	44·19	32·02	34·75
Crawstone	Madeley Wood	51·45	33·21	40·27

From an average of the above analyses of the ironstones of Shropshire, the yield of metallic iron may be taken at 36 per cent.

PIG-IRON MANUFACTURE.—The early history of this industry, now universally regarded in importance as next to coal, the great auxiliary to the power, wealth, and progress of mankind, is intimately associated with Shropshire. When in the beginning of the last century the exhaustion of our forests and woodlands was imminent, occasioned by the demand for the necessary charcoal fuel to sustain these industries, attention was directed to the useful application of coal in the blast-furnace; the difficulties, however, were considerable, and it was not until Mr. Abraham Darby, at the Coalbrookdale Works, between the years 1730 and 1735, successfully solved the problem, that the use of coal previously coked came into use in the reduction of the ores of iron in the blast-furnace. A most interesting chapter might be written if space allowed recording the many facts connected with the Coalbrookdale Works and the influence the discoveries there made have exercised on the iron industries of Great Britain. It may, however, be mentioned generally that it was also at these works that Mr. Abraham Darby's father had previously introduced the art of casting iron, and that at a later period the first iron bridge constructed in this country was successfully carried out, and is that which at the present time spans the River Severn at the thriving town of Ironbridge. Darby having in the year 1735 succeeded in making pig-iron with coke, experienced a new difficulty, that of securing blast of sufficient pressure to ensure the complete utilisation and combustion of the hard dense coke in the furnace, and it was not until a quarter of a century later that his difficulty was overcome by the introduction of powerful blowing machinery, in which Smeaton led the way, followed by Watt and others. With these introductory remarks, the next point for consideration is the production of pig-iron, and the earliest return published shows the following quantities for the year 1740, when it will be seen that Shropshire, as an iron-producing district, ranked second in importance in England and Wales, and yielded 12 per cent. of the iron made:—

Counties.	No. of furnaces.	Pig-iron.
Breconshire	2	Tons 600
Cheshire	3	1,700
Carmarthenshire	1	100
Derbyshire	2	550
Glamorganshire	2	400
Gloucestershire	4	800
Hampshire	3	1,350
Herefordshire	6	2,850
Kent	1	200
Monmouthshire	2	900
Montgomeryshire	4	400
Nottinghamshire	1	200
Shropshire	6	2,100
Staffordshire	2	1,000
Sussex	10	1,400
Warwickshire	2	700
Worcestershire	2	700
Yorkshire	6	1,400
Total	59	Tons 17,350

The average make of the above furnaces at this period was, therefore, 294 tons of pig-iron, coke being principally employed, except in the case of the Kent and Sussex furnaces, where there is every reason to infer that charcoal was still in use. In the year 1754 the works at Horsehay were established by Mr. Abraham Darby, of Coalbrookdale, previously referred to, and the first furnace put in blast two years later; it is recorded that from 20 to 22 tons of coke pig-iron was made weekly, and such was its superior quality that it met with a ready sale. Until the year 1788 details are wanting to show the production; for this year, however, a well authenticated return was published, showing the make of charcoal and coke pig-iron, the details of which will be found in our notice of the Iron Industries of Derbyshire. The total make of England and Wales is given below, with that made in Shropshire for comparison, and from which it will be seen that in 1788 Shropshire still continued a large producer of pig-iron to the extent of 40 per cent. of the aggregate make of England and Wales:—

	Charcoal pig-iron.		Coke pig-iron.	
	Furnaces.	Tons.	Furnaces.	Tons.
England and Wales	24	13,10	53	48,200
Shropshire	3	1,800	21	23,100

Towards the close of the year 1800 a Committee of the House of Commons was appointed to enquire into the condition of the Coal Trade, and in a letter addressed to the Chairman, William Manning, Esq., M.P., by Dr. H. G. Macnab, who represented the iron trade, are found very valuable statistics, showing the make of pig-iron in Great Britain in the year 1796, when the production of Shropshire was as follows, that of Great Britain being 125,079 tons:—

Works.	No. of furnaces.	Pig-iron made.	Aver. make per fur.
Benthall	1	Tons 1,334	Tons 1,334
Broseley	1	1,076	1,076
Coalbrookdale	3	2,659	886
Donnington Wood	2	3,323	1,108
Horsehay	1	1,458	1,458
Jackfield	2	1,820	910
Ketley	3	5,069	1,689
Lightmoor	3	3,498	1,166
Madeley Wood	1	1,856	1,856
Old Park	3	5,952	1,984
Snedshill	2	3,367	1,122
Willey	1	1,554	1,554
Total	23	32,966	

Thus, while in the year 1740 the average make per furnace was 294 tons, the above table shows that in the year 1796 the average had increased to 1433 tons, from which it will be seen that the furnaces will have been reconstructed, and their capacity greatly increased. A period of 10 years intervene, during which many new furnaces were built, and new works established, and in 1806 the following statement shows the condition of things, when 42 furnaces were built, of which 30 were in blast, making 54,966 tons of pig-iron, giving an average make of 1832 tons per furnace:—

Works.	Furnaces—Built.	In blast.	Make of pig-iron.
Barnets Leasow	2	1	Tons 574
Benthall	1	1	1,294
Billingsley	2	0	—
Broseley	1	1	1,450
Calcott	5	1	2,269
Clee Hill	1	1	303
Coalbrookdale	2	2	2,962
Cornbrook	1	1	292
Donnington Wood	3	2	3,400
Horsehay	2	2	3,834
Lightmoor	3	3	5,601
Ketley	4	2	7,510
Madeley Wood	2	2	2,951
New Hadley	2	2	3,612
Old Park	4	4	8,359
Queenswood	1	1	2,605
Snedshill	3	2	3,950
Willey	1	0	—
Wrockardine	2	2	4,000
Total	42	30	Tons 54,966

The total quantity of pig-iron made at this period by the 161 furnaces in blast amounted to 243,851 tons, apportioned to Great Britain as follows:—

	Furnaces—In.	Out.	Total.	Pig iron.
England	105	35	140	Tons 149,163
North Wales	3	1	4	2,981
South Wales	35	10	45	68,867
Scotland	18	9	27	22,840
Total	161	55	216	Tons 243,851

Shropshire at this period contributed upwards of 20 per cent. of the iron produced in the kingdom, while the average make of the blast-furnaces had increased from 1433 tons in the year 1796 to 1832 tons in 1806. Advancing to the years 1823 and 1830, when Mr. F. Finch prepared a statement for the Government of the pig-iron made in those years in Great Britain, we find the following quantities recorded:—

Districts.	1823.	1830.
Northumberland and Durham	Tons 2,379	Tons 5,327
Yorkshire	27,311	28,926
Derbyshire	14,038	17,999
Shropshire	57,932	73,418
Staffordshire	133,590	282,604
South Wales	182,325	277,643
North Wales	13,100	25,000
Scotland	24,500	37,500
Total	Tons 454,866	Tons 678,417

These figures show an increase since the year 1823 of 223,651 tons, being upwards of 50 per cent., while the increase in the Shropshire district amounted to 15,495 tons, or 26 per cent. The statement following shows in detail the result of Mr. Finch's enquiry in each of the years named for the Shropshire works:—

Ironworks.	1823. No. of furnaces.	1823. Pig-iron made.	1830. No. of furnaces.	1830. Pig-iron made.
Broseley	2	Tons —	2	Tons 270
Barnett Leasow	2	2,755	1	1,316
Benthall	1	—	1	—
Calcutt's	2	1,833	2	—
Coalbrookdale	2	—	2	—
Dawley Castle	2	4,925	2	4,313
Donnington	3*	8,074	5	15,110
Horsehay	3	4,854	3	6,833
Hadley	2	2,080	2	—
Ketley	3	4,984	3	5,763
Lightmoor	3	6,052	3	6,194
Madeley Wood	3	2,475	3	3,471
Old Park	4	6,900	4	15,300
Snedshill	2	2,786	2	317
Wombridge	2	5,084	3	7,134
Wrockardine	2*	5,121	2	—
Stirchley	—	—	1†	—
Lawley	—	—	1	3,073
Langley	—	—	2	4,325
Total	38	Tons 57,923	48	Tons 73,418

* Two furnaces were built at Donnington in the year 1828, in the place of the two at Wrockardine, which were blown out.
† The quantity made in 1830 is included in the Old Park returns.

The hot blast, the invention of Mr. James B. Neilson in the year 1828, exercised an important influence in the increased production of iron, more especially in Scotland; later the system was adopted in the furnaces of England and Wales, though but partially in some districts, as for example, the West Riding of Yorkshire, North Staffordshire, South Wales, and this district, where many of the works still employ cold blast producing iron of a superior quality, which is in great request in the malleable works of the county. The next account of production to which attention is directed is for the year 1839, when there were 29 furnaces in blast in Shropshire, producing 80,940 tons, giving an average of 2791 tons per furnace, the make of Great Britain the same year being 1,248,781 tons, showing an increase since 1830 of 570,364 tons of pig-iron. Again, in 1840 Shropshire had 24 furnaces in blast, producing 82,750 tons of pig-iron, and in 1843 a falling off is observed to the extent of 6550 tons, the make of pig-iron in that year being returned as 76,200 tons. This falling off in the production of pig-iron was general in all the districts of Great Britain, and was due to the great depression of trade, which lasted from about 1840 to 1845; it was at this time that the great expansion of our railway system set in, causing a great demand for iron of all kinds, and better prices; to compare the extent of production at this eventful period, the returns for the years 1840, 1843, and 1847 are given:—

District.	1840. Pig-iron.	1843. Pig-iron.	1847. Pig-iron.
Derbyshire	Tons 31,000	28,750	95,160
Forest of Dean	15,500	8,000	—
North Staffordshire	20,500	21,750	65,520
Northumberland	11,000	25,750	99,840
Shropshire	82,750	76,200	88,400
South Staffordshire	407,150	300,250	320,320
Wales, North	26,500	19,750	16,120
Wales, South	505,000	457,355	706,680
Yorkshire	56,000	42,000	67,600
Scotland	241,000	238,550	539,968
Totals	1,396,400	1,215,350	1,999,608

Thus it will be seen that between the years 1843 and 1847 the iron industries of Great Britain bounded forward at a rapid pace, which has been generally well maintained since that year to meet the many commercial requirements in which iron is now so universally employed. In the year 1852 Mr. Braithwaite Poole, in his Statistics of Commerce, gives the production of pig-iron in Shropshire as 120,000 tons, the make of 27 furnaces. The make of the 497 furnaces in Great Britain he records as being in blast the same year amounted to 2,701,000 tons. The returns of production in Shropshire in the years given are as follow, and for comparison we give side by side the production of Great Britain in the same years:—

Years.	Furnaces—Built.	Shropshire. In blast.	Shropshire. Pig-iron.	Great Britain. Pig-iron.
1854	34	28	Tons 124,800	Tons 3,069,838
1857	31	26	117,141	3,659,447
1860	32	26	145,200	3,826,752
1863	31	22	135,557	4,510,040
1867	29	22	123,604	4,761,023
1870	29	22	112,300	5,963,515
1871	29	19	129,467	6,627,179
1872	29	22	133,046	6,741,929
1873	29	21	135,149	6,566,451

The Lilleshall and Haybridge Company's Works, and those at Madeley Court, are the most recently established of those in Shropshire; they are of considerable magnitude, the first-named having five furnaces at Lodge Wood making cold-blast iron, and four at Prior's Lee, where a fifth is in course of construction of greater capacity than those existing, and arrangements are being adopted for the utilisation of the gases; these works are near Shiffnall, and possess, in addition to the furnaces, extensive foundries and engineering establishments where locomotives for colliery purposes are made on a large scale. The Haybridge Company's furnaces are also situated near Shiffnall, while the works at Madeley Court are situated at Ironbridge. With the following statement of the works and companies in operation in the year 1873, the history of this industry is brought up to date:—

Works.	Companies.	Built.	In blast.
1.—Dark Lane 2.—Hinkshay 3.—Lawley 4.—Lightmoor 5.—Castle	Haybridge Iron Company (Lim.)	4	3
6.—Ketley	Ketley Company	1	1
7.—Lodge Wood 8.—Prior's Lee	Lilleshall Company	9	7
9.—Madeley Wood	Madeley Wood Company	3	3
10.—Madeley Court	William Orme Foster	4	2
11.—Old Park	Old Park Iron Company	4	2
Total		29	21

COAL USED IN PIG-IRON MANUFACTURE.—Mr. David Mushet states in his papers on "Iron and Steel" that 4 tons of coke was the quantity of fuel employed about the year 1810 for each ton of pig-iron made in Great Britain. In Shropshire it was ascertained, about the year 1840, by Mr. William Jessop that the quantity of pig-iron made amounted to 82,750 tons, consuming in its manufacture 409,000 tons of coal, or nearly 5 tons of coal to each ton of pig-iron. In Great Britain, in the same year, Mr. Jessop further ascertained that the quantity of pig-iron made amounted to 1,396,400 tons, consuming 4,877,000 tons of coal, or an average of 3½ tons of coal to each ton of pig-iron manufactured. In July, 1867, the Commissioners appointed by a Royal Commission in the previous year (June 28, 1866) to enquire into the question of the probable duration of our coal fields and their resources, began the important enquiry entrusted to them, and periodically for five years pursued their investigation. The most scientific, practical, and thoughtful men in the kingdom were examined, and the result of the investigation, so full of interest to the well-being and future of the United Kingdom, was, in 1871, published in Blue Books of three volumes. This investigation of the Coal Commission, as regards the statistical enquiry, was entrusted to the late Sir Roderick I. Murchison and Mr. Robert Hunt, Keeper of Mining Records, and forms vol. iii. of the Coal Commission Report, consisting of nearly 500 pages. The deductions drawn from this report show that in the year 1869 the quantity of coal employed in the manufacture of a ton of pig-iron amounted to 3 tons in Great Britain, and the enquiries subsequently instituted by the Mining Record Office show that in Shropshire in the years 1872 and 1873 it amounted to the like quantity, while taking the average of Great Britain in the same years, 1872 and 1873, we find that 51 cwts. of coal was the quantity used in the make of each ton of pig-iron.

IRON ORE USED IN MAKING PIG-IRON.—There were employed of all kinds of iron ore, in the year 1872, in the manufacture, in Shropshire, of 133,046 tons of pig-iron, 385,000 tons, and in the year 1873, in the make of 135,149 tons of pig-iron, 390,000 tons of ore. These quantities give an average of about 58 cwts. of ore to each ton of pig metal made, and for the year 1873 this ore was supplied in the following approximate quantities by the undermentioned districts—

Shropshire	Tons 306,500
North Staffordshire	6,500
Northamptonshire	50,000
Other places	27,000=390,000.

The Shropshire ore, as previously stated, yields an average of 36 per

cent. of metallic iron, the North Staffordshire ores 36¼ per cent., the Northampton ores 40 per cent., and that from other places, a part of which is hematite, a much higher yield, probably not less than 50 per cent.

MILLS AND FORGES.—The works of the Coalbrookdale Company, situated at Horshay, near Wellington, and comprising forges and rolling mills, were commenced about the year 1753, but upon the introduction of rolling iron by Mr. Henry Cort, in the year 1783, they were considerably enlarged, and the rolling mills were erected; it was estimated in the year 1856, by a local authority, that the quantity of finished iron, in bars of all sizes and sections, amounted to 15,000 tons per annum. The works at Ketley are noted as being amongst the oldest in the kingdom, and it was here the first iron railway was laid down, towards the close of the last century. The following presents a complete list of the works, owners, and the number of mills and forges in operation in the year 1873:—

Works.	Owners.	Situation.	No. of puddling furnaces	No. of rolling mills.
Horsehay	Coalbrookdale Iron Company	Wellington	40	5
Stirchley	Leighton and Grenfell	Ditto	16	3
Ketley	Ketley Iron Company	Ditto	20	3
Eagle	The Eagle Ironworks Co. (L.)	Ditto	18	3
Trench	The Shropshire Iron Company	Ditto	28	3
Wombridge	Wombridge Iron Company	Ditto	10	3
Haybridge	Haybridge Iron Company (L.)	Ditto	10	1
Old Park*	Old Park Iron Company	Shiffnal	—	—
Snedshill	Snedshill Iron Company	Ditto	40	5
Total of Shropshire			182	26

* Works standing.

The pig-iron employed in these malleable ironworks is furnished by the blast-furnaces of the district, the Snedshill and other works being supplied by the Lilleshall Company's furnaces. The Haybridge Company have recently added a new feature to the manufacturing industries of the county. Hitherto the nail trade has been carried on by hand labour, but now we learn that the company have suitable machinery at work successfully carrying on this branch of industry.

COAL USED IN MILLS AND FORGES.—The coal employed in the years 1872 and 1873, in the puddling-furnaces and rolling mills in operation, including all purposes where heat was required, amounted to 160,000 tons in each year; this will give an average consumption to each puddling-furnace of nearly 900 tons of coal; and taking 50 cwts. as the quantity of coal necessary to convert the pig into finished iron of various forms, we would have an approximate quantity of 64,000 tons representing the production of Shropshire in the year 1873 of all kinds of finished iron.

COAL-CUTTING MACHINERY.

SIR,—The report that I have received from the Woolley Colliery as to what took place there on Monday, the 7th inst., is to the following effect:—That Mr. Bass had given no intimation whatever of his intention to be there on that day; that the pick machine did its usual quantity of work on that day, and in a satisfactory manner, in the usual time; that 53 yards were cut in the shift to the depth of 42 in.; that a leak in the air pipes having happened, the principal machineman went off to discover it; and that Mr. Bass took himself off at the time, and when, a rail end having jumped out of the sleeper, which was set right in a few minutes.

The work done in that shift was about 60 yards of groove, averaging as nearly as possible 7½ yards per hour; and this in strict accordance with the statements made by me, as your readers can readily prove by reference to my letters; but the Barnsley seam is not one which I have alluded to as favourable for much yardage, as there are other considerations of far more importance in connection with the working of this bed. If this information be true, it is plain that the account given by Mr. Bass, jun., in your columns of last week cannot be so; because he says that "it was impossible to go further, and we were obliged to give it up," after cutting 1½ yard.

Your readers must feel that some responsibility ought to attach to the *bona fides* of your correspondents, and they do feel that mere assertions of "superiority" are only employed for the purpose of deception so long as the means of investigation are resolutely withheld. And in order that this single case may be tested, whether or no, the report of Mr. Bass, jun., as given in the Journal of last week, is a fair, reasonable, and candid account of the working power of the pick machine? I will undertake to pay 50*l.* to the treasurer of the Leeds Infirmary, provided a competent person, nominated by yourself, shall on investigation on the spot find it to be so; but, provided that it should be otherwise, then that Mr. Bass, jun., shall pay 25*l.* to the same charity. And I hope that no plea of conscientious scruples will be permitted to raise up a barrier which shall stand in the way of a truthful issue being at last obtained.

Referring to my challenge of last week for a more general contest, I beg to suggest that the Mayors of Sheffield and Leeds, and the Editor of the *Mining Journal*, should form a committee with full and absolute power to settle and determine all matters connected with the proposed competition. WILLIAM FIRTH.

Burley Wood, Leeds, June 16.

COAL-CUTTING MACHINERY.

SIR,—I see by a letter you publish in last week's Journal from Mr. Firth, that that gentleman is desirous of changing the ground for the trial of the pick and rotary machines. On May 12 last he made a proposal, evidently the result of careful and deliberate consideration, that the trial should take place at the New Market Colliery. This proposal, with the exception of the money bet, I accepted in my letter under date of May 27, and to that proposal I must hold Mr. Firth. If he is wishful to withdraw from such a contest he has simply to inform you and there will be an end of the matter. You will observe that neither the proposal nor the place selected originated with me; it was entirely Mr. Firth's planning, and as such, it is altogether out of the question, after the challenge has been accepted, that he should be allowed to shift his ground. Whether the trial is accompanied by a money-wager or not, cannot in the most remote degree affect the result. Mr. Firth professes to think it strange that I will not back my opinion in this way; my only answer is, I am not a betting man. I never had a bet, and I am not going to begin over this.—*Sheffield, June* 16. ISAAC GRAY BASS.

COAL-CUTTING MACHINERY.

SIR,—As the manager of Woolley Colliery for the last ten years, I beg to make some explanation respecting a letter which appeared in the *Mining Journal* of the 12th inst., from Mr. I. G. Bass, of Sheffield, whose son came to the above colliery on Monday, the 7th inst., and asked leave of me to go and see the Pick Machine, which I readily granted.

I was busy with other matters, and did not go down into the workings with Mr. Bass, but Mr. Cooper, the mechanical engineer, went with him. But I am perfectly acquainted with the place, and also have a daily report from the man in charge of the machine of the work done, and I am very much surprised at the incorrect statements given in your Journal by Mr. Bass.

Mr. Bass says he arrived at the colliery at 12·30 P.M.; the men in charge of the machine went down at 1 P.M. "Fact" says a little after 2 they left the surface. Mr. Bass at 3·30, or 2½ hours after the air was turned on. "Fact" says 1½ hour after leaving surface. Then Mr. Bass—Two newly sharpened points were set to work. Would Mr. Bass have started with blunt ones? Mr. Bass says 3 ft. under. "Fact" says 3 ft. 6 in. Mr. Bass says—Having done two points. "Fact" says one. I would just say the floor is very hard here, and has a dip of 1 in 7. One of the rails did fly out of the joint sleeper, "and it was impossible to go any further" until the rail was put right. Mr. Bass did "give it up," but the men did not. Mr. Exley, the man in charge of the machine, left with Mr. Cooper and Mr. Bass to show Mr. Cooper some leakage in the air pipes. Mr. Cooper said half the wind was going away. Mr. Exley being back shortly got his tea, then went back to the machine, and in five hours cut 44 yards a depth of 42 in., which was not bad after "we were obliged to give it up." Mr. Exley has frequently cut 11 or 12 yards an hour 42 in. under. On Feb. 11, 1874, the same man, with the younger brother of the same machine, cut 107 yards in 10½ hours' cutting, and 12 hours from the surface.

Mr. Bass promised to send one of his Gillott and Copley machines to cut on the same ground with the Pick Machine some early day this week, so that I expect you will have the pleasure of reporting the result of the trial in your next. As manager of the underground department, I am very anxious that the two should be fairly tried, for I believe they are both good. Then surely an end will be made of these contradictory accounts, which ought not to exist in a question of so much importance. I am in fairness bound to say that I have wrought with the Pick Machine for three years, and in many cases under very dangerous roof or cover. I have had the machine buried for days, and in one case under fathoms of water for six months, and I never found the Pick in fault—always ready. I have one great consolation—that though we have cut much coal with the machine that would have cost much money to have made safe for men to have done by hand, we have not had one man injured while working the machine. WM. MADDISON.

June 16. Certified Manager, Woolley Collieries, Yorkshire.

COAL-CUTTING MACHINERY.

SIR,—In last week's Journal I see that Mr. Firth proposes to send one of his machines to our colliery, to be tried in competition with those of Gillott and Copley. Had ours been the only place where the Gillott and Copley machine is in use I should have felt bound to fall in with his suggestion at whatever inconvenience. As, however, there are other places where arrangements can be made through Mr. Bass for a trial, I must ask Mr. Firth to excuse my participation in the experiments as I am leaving shortly for the Continent, and I should not care for any experiments to be made in my absence. The experiments at New Market Colliery cannot fail to be instructive; but I would suggest that both machines should cut in the *coal*, as the results would then be more generally useful to the mining community, as it is not every seam which has a band so favourable as that at New Market.

Referring to Mr. Bass's letter, the results obtained at Wooley Colliery are very inferior to those Mr. Firth appears to obtain at West Ardsley. If arrangements could be made could not Mr. Bass send a machine to Wooley? A MINING ENGINEER.

PROHIBITION OF EXPLOSIVES IN THE WORKING OF COAL MINES.

SIR,—This question has often been discussed both in the Journal and other papers, but as yet with no satisfactory results. I acknowledge the apparent "farce"—to prohibit the use of naked lights and allow the use of blasting; and I am also aware of the difficulty in getting down the coal without blasting in some mines, even if worked on the long wall system, which is by far the best that can be adopted for getting the coal without the use of explosives. I should like to ask, through the *Mining Journal*, the opinion of mining engineers, and more especially those that are using compressed air, and are well acquainted with its behaviour at a high pressure, if it is not possible to get coal down by compressed air? Such men as Mr. Firth, and others, who have compressed air in the workings, and also small engines to drive their coal-cutters, might very easily attach a small cylinder to their present coal engines (say) about 1½ in. diameter, to pump air into a small receiver also attached to the same engine, to hold about 2 cubic feet of compressed air, compressed as high as possible by the small pump driven by the coal-cutting engines, then a proper apparatus prepared with a centre tube put into the hole drilled to receive it, connected with a pipe to the air vessel; all being prepared, allow the air to pass into the hole by a pipe and tap adapted for the purpose, similar to the action of an air-gun. Could this be done, it would at once satisfactorily settle the question so far as the getting down of coal is concerned in driving "cruts" or brown in rock be a severe test. If you think the suggestion worth the consideration of mining engineers my object will be accomplished. A COLLIER.

June 16.

P.S.—The small vessel could be filled with air compressed on the surface before the small pump began to work, then a very short time would be necessary for the engine to drive the small pump only, the cutters of course being disconnected. A. C.

BLASTING POWDER IN COLLIERIES.

SIR,—I was somewhat surprised to learn from the reply of the Home Secretary to Mr. Macdonald that "there are powers in the Mines Regulation Act to prevent the use of gunpowder in mines, and thereby lessen the amount of danger," and more especially so as Mr. Wynne, one of the oldest of the Government Inspectors, stated exactly the contrary. Mr. Cross no doubt refers to the 8th general rule, but this practically does no more than Mr. Dowdeswell proposes to do by special Act of Parliament, since it only provides that for three months after there has been found sufficient inflammable gas to show a blue cap on the flame of the safety-lamp gunpowder or other explosive or inflammable substance shall only be used when the persons ordinarily employed in the mine are out of the mine, or out of the part of the mine where it is used. Now, this is far from giving power to prevent the use of gunpowder in mines, and I can see no clause which enables even the Secretary of State to prohibit the use of explosives altogether in any colliery in ordinary process of working. Clause 46 certainly would not apply.

But even assuming that the Coal Mines Regulation Act does give the power mentioned, would it not be preferable, in order to secure justice to all coalowners to make the prohibition general by a short special Act? It must be obvious to the least practical persons that if at Bunker's Hill the only reason for "the change from wedging to blasting in that colliery was to increase production, and lessen cost," it would be most unfair to compel one coalowner to get his coal by wedging, and permit another, perhaps a near neighbour, to resort to blasting. I am not, however, so sure that, all things considered, wedging is the more expensive method of working, especially as Mr. Wynne very truly points out that when there is no blasting, falls, as well as explosions, are better guarded against.

June 14. FAIR PLAY.

DIAMOND ROCK BORING.

SIR,—With reference to a paragraph in your local Correspondent's letter in last week's Journal upon this subject, I beg to enclose another from a local newspaper, giving a more detailed account of the same. The progress is, indeed, truly wonderful, but the point which most deeply affects us miners—namely, the cost—is not touched upon at all. We are left entirely in the dark. If I am not incorrectly informed the cost of the Hope Level, at Stanhope, amounts to *twelve pounds per yard*. I should like very much to know the real state of the case. I have never attained the speed of the Diamond drill by one-half, but then the *price* has never exceeded 4*l.* 5*s.* per *yard;* it is now going at 2*l.* 12*s.* 6*d.* per yard, and for six months in 1874 went at 1*l.* 19*s.* per yard, averaging five yards per week. Speed is no doubt of very great importance, but cost is not less so.

Junior United Service Club, June 17. GEO. WM. DENYS, Bart.

MINING OPERATIONS.—To those who have not seen the working of the Diamond Rock Drill the following may be interesting:—On Saturday last a number of gentlemen interested in lead mining, railway tunnelling, and similar works assembled at Stanhope to witness the working of this drill in Hope level, which is a gallery about 7 ft. high by 6 ft. wide, being driven through very hard mountain limestone to reach the lead ore known to exist at a certain point. Already about half-a-mile has been perforated. The party proceeded in little tram-wagons drawn by a horse. On leaving these, they found the machine had ceased working after drilling 14 holes in the perpendicular face which terminated the gallery, and the framework which carried the drills had been lowered, so as to enable the workmen to shift the machine back till it should be beyond reach of danger from the effects of blasting. A 20-horse engine is employed outside the workings to condense air to a pressure of 40 lbs. per square inch, which is conducted along the level by cast-iron pipes to within a short distance of the working face, and a flexible India rubber tube connects the pipe with an air-engine, which raises and lowers the frame alluded to above, and gives a circular action to the drills, which, when working, are gradually advanced by a screw motion. The cutting is done by diamonds, which are set round the end of a steel drill, which is itself a hollow cylinder. The diamonds overlap the cylinder's edge sufficiently (both inside and out) to enable it to clear itself, and bring away a core of the material acted on—a very valuable consideration when the drill is used for boring for coal or other mineral, as an exact section of the strata can be registered with the cores. Although the machine had completed its allotted work, on the arrival of the visitors the air was turned on, and the frame screwed back to its bearings, and being secured, a drill was adjusted for a new hole to exhibit the capabilities of the machine. Though all present were practically acquainted with mining operations, those who witnessed the action of the drill for the first time were greatly astonished, for a hole 2½ in. diameter was driven 6 in. into an exceedingly hard limestone in one minute thirty five seconds. The machine was then moved back to a place of safety, and four of the most central holes were charged with dynamite. After firing the charges it was found that the entire face of the rock to the depth of 3 ft. 6 in. had been brought away so completely that nothing remained to restore an even face again but to remove the two little corners at the foot in which were the only two holes remaining of the 14 originally drilled. Thus eight unnecessary holes had been made, but as the machine works so quickly, it is considered better to drill extra holes, rather than risk leaving a portion of the rock, which would have to be removed before the drill could be brought up to its work again. Those who know what it is to blast a solid face of rock, fast all around, will easily understand how satisfactorily dynamite did its business in this instance, and those present were as much surprised at this result as they were at the rapid action of the drill itself. The level is thus being driven at 10 yards a week.—*Newcastle Daily Journal.*

ROCK BORERS.

SIR,—The following particulars respecting the working of Sach's Boring Machinery at the Johann Colliery, in Prussia, will, doubtless, interest many of your readers:—

HAND WORKING.

Dimensions of shaft, width 14 ft., length 16¼ ft.
Rock, hard sandstone, sandstone schist, and schist.
Time worked, December 1873, to April 1874.
Depth sunk in sandstone and schist, 26 ft.
Cost per meter, including dynamite, 16*l.* 1*s.*

MACHINE WORKING.

No. of months worked, six.
Total depth sunk: sandstone, 8 meters; sandstone schist, 60 meters = 68 meters.
Average depth of hole bored per borer: sandstone, 12 in.; schist, 58 in.
Average depth sunk in shaft per month: 10 8-10 meters (say), 5½ fms.
No. of boring machines employed, 6.
Total number of holes bored per 68 meters of ground sunk, 1412.
Average number of holes bored per meter of ground sunk, 20.
Men employed in sinking shaft, including labourers, 20 to 22.
Duration of shift, 8 hours.
Total number of shifts worked, 2562
Average number of shifts worked monthly, 427.
No. of pounds of dynamite consumed, 1823.
No. of coils of fuze, 492.
Average quantity of water supplied to holes per minute, 8 to 12 gallons.
Total cost of repairing and duplicating parts of boring machines, 76*l.* 4*s.*
Fitters' wages, 36*l.*
Grease, oil, &c., 17*l.* 11*s.*
Cost of boring per hole, 1*s.* 4*d.* to 2*s.* 4*d.*
Machine cost per meter sunk, 1*l.* 14*s.* 2*d.*
Labour cost, including cost of timber per meter sunk, 14*l.* 6*s.* 6*d.*
Total cost, including labour cost, materials, and machine cost per meter sunk, 16*l.* 0*s.* 8*d.*

It will be observed that the cost by hand was 16*l.* 1*s.* per meter, the cost by machinery and hand labour 16*l.* 0*s.* 8*d.* per meter. The rate of sinking by hand was about two meters per month; the rate with 20 men and 6 boring machines 10 8-10 meters monthly, or somewhat more than five times the rate of sinking by hand labour alone. From the foregoing statistics we may gather that there was little, if any, saving in the relative cost of the work, and that the increased rate of sinking for six months ending March was due to the energetic and systematic use of large boring power. The total cost of repairing and duplicating parts of the boring machines, exclusive of engineers' wages, was 22*s.* 4*d.* per meter. At Blanzy Collieries (Saone-et-Loire), in France, when the Dubois and Francois machines were employed, the cost of repairing and maintaining the machines was about 8*s.* per meter. With the Darlington Borer, which has superseded the Dubois and Francois at the collieries in question, the cost of repairing and maintaining the machines is reduced to 1*s.* 9*d.* per meter. X.

"A BIRD IN THE HAND IS WORTH TWO IN THE BUSH."

SIR,—The General Assurance Expenditure Company (Limited) invites me, instead of taking my discounts in cash, to leave them with my tradesmen, who will hand them over to this company, and they, in their turn, undertake to invest them at 5 per cent., compound interest, and return me the money when, by its accumulation, it amounts to the sum I spent originally. The panegyrists of the company, with mild forethought, admit that it may be my children, or the second or the third generation, who will reap the benefit of my abstinence. I fancy the third generation would be fond of this world, if even he wished to live till this revision should fall to his share.

The old story which has dazzled so many minds before, and is still useful for bewildering the public, is re-told—the wonderful procreative power of compound interest. A sum invested at 5 per cent. compound interest will double itself in about 14 years, treble itself itself in 23 years, quadruple itself in 29 years, and so on up to 62 years, when it will multiply itself twentyfold. A shilling will become a sovereign, and 5*s.* a 5*l.* note. This company, then, proposes to take 5*s.* discount, which you may be entitled to, and in 62 years you may expect 5*l.* But this is not enough. The nation is speculative—some people may call it gambling. There is to be a lottery. You may go in for getting your 5*l.* this year or next, and have a cast in the ballot for it. It is true this will defer the time at which the unfortunates who do not draw a prize are to receive their 5*l.* Thus the 62 years becomes 75. Instead of 62 years certain you will get a chance for next year, or 75 years hence.

But the expedients of the promoters of this company are not yet exhausted. Harry spent 5*l.* in household necessaries, and instead of 5*s.* discount in cash takes a coupon for 5*l.* any time between now and 75 years hence. If you accumulate a dozen of these coupons—3*l.* in money—60*l.* in future reversionary value—and if you are a healthy life you may have a life policy for 100*l.* If you are not a healthy life you may attempt to master the meaning of the following sentence, and then you will know what are your advantages:—"The company undertakes, at any time after three years from the completion of each series, to give an equitable surrender value for the bonds after the manner adopted in life assurance societies with policies." Such is the company's scheme as published.

It might be complained that there is a little ambiguity in two or three of their proposals. What is the certain proportion of bonds to be redeemable every half-year by ballot? Why are unhealthy lives, who are uninsurable in first-class offices, to have the advantage of surrendering their bonds without ballot, after three years from the completion of the series? What is meant by the completion of the series? Is it a sonorous term for 75 years hence? What is the nature of the life assurance policy the company will issue for an equivalent to 3*l.* cash, upon any good life at any age within insurable limits? It is a term policy for one year, or is it a paid-up policy payable at death whenever that may happen? We do not know what marvels this company can perform. Can it really for 3*l.* in one payment get me insured in a first-class office for 100*l.*?

Let us assume that the company is in reality formed and anxious to carry out its proposals in good faith, and let us examine its probabilities of success. We must not forget that except the bonds redeemable under ballot and what may be paid on life assurance premiums, the liabilities of the company are to mature at long dates, 62 to 75 years hence. For even more years than a life assurance company it receives, and should accumulate, its funds against the distant liability. The company assumes (1st) that all its income is immediately and continuously to be invested at 5 per cent. interest compounded annually; and (2nd) that there is to be no deduction from its income for the expenses of the business, either at head office or agencies, or from bad debts. Are these reasonable assumptions? 1st. Where is 5 per cent. to be had under these conditions? The best managed life assurance offices, who keep specially qualified officers to attend to their investments, get an average rate of 4½ per to 4¾ per cent., as appears from their returns to the Board of Trade under the Life Assurance Companies Act, 1870. They do not say it is a continuous rate upon all moneys. They do not adopt more than 4 per cent. in valuing their liabilities.—2nd. There are expenses in conducting this business, companies are not managed, offices kept up, agencies established, and advertisements inserted for nothing. We

may safely say the expenses will be 33 per cent. of the income, and that the rate of interest realisable continuously will not exceed 4½ per cent. If such be the case, the 5s. received will be reduced to 3s. 4d. for investment, and this must multiply itself thirtyfold to grow to 5*l*. This will require 82 years instead of the 62 the company provide for, and following their own rule, that the effect of balloting part is to extend the time of the other bonds till they again double themselves, the 75 years of the company will become 88 years. That is, it will be about a century hence before one might get his 5*l*. for his 5s. If he took his discount in cash from the tradesman he could spend it or invest it at pleasure, with right of re-entry when he choose, without tying it up in the company for a century.

Lastly, how can the company avoid bad debts? Tradesmen sometimes fail. It is then found they keep their books badly. There may be no record of what has become of coupons entrusted to them. Suppose some tradesmen have issued coupons, and do not hand the discount to the company, will the company repudiate its liability to the holders? This is an element of loss not to be despised.

The company proposes to do for the public what each man could do for himself much more cheaply, and that which the individual could not do the company will fail to perform, assuming that it honestly tries to carry out its programme. W. E.

MINING ON THE PACIFIC COAST—EASTERN NEVADA.

NO. VIII.

SIR,—In my letter of May 14 [published in the Supplement to last week's Journal], while discussing the immense producing capacity of the Comstock Lode, I unwittingly overstated the monthly bullion product of the Consolidated Virginia Mine, and understated the number of its shares. By reference to a recently issued official statement of the company's operations I find the former laid down for the fiscal month ending with the 8th inst. at $1,509,143·60, and the latter at $108,000. The usual monthly dividend of $10 per share has also been just declared, aggregating $1,080,000; and since this amount has been disbursed by the mine each month since last March, we have a total of $5,240,000 that has found its way into the pockets of shareholders since that auspicious month. How complacently those "bleated bondholders" must contemplate the brightening prospects before them! Their transitions from obscurity to notoriety have been so rapid as to cause us to recall all the tales of eastern romance over which we have often pored in early life. Truth is sometimes stranger than fiction, and the truth proves to us how easy it is for Messrs. Flood and O'Brien to furnish the little trifle of $5,000,000 capital for their new bank, which is soon to be opened to the public of San Francisco, under the management of one of our ablest financiers. So goes the march of almost improbable events. These sudden elevations, however, cause but very little surprise on the Pacific Slope, being of too frequent occurrence to create more than the traditional nine days wonder. In older countries wealth is slow of growth, and those who are fortunate enough to acquire it are looked upon by the gaping multitude as the especial favourites of fortune; while here the reverse appears to be the case, owing to the bounties of Providence. In Europe wealth is conservative and exclusive, while here it is radical and progressive. There it instinctively arrays itself in elaborate touch-me-not garments, to prevent the contaminating approach of the vulgar parvenus of society; here it is democratic, sociable, generous, and not unfrequently exalted in social life by the dignity and refinement that mark the bearing of its possessors in both their public and private relations.

The money market has of late been entirely ruled by the fluctuations in gold, but the stringency which the Bears have been predicting would take place has not occurred; therefore, the financial horizon remains unobscured. Rumours have been flying about rather freely of late, but from appearances there has been no real tightness in financial circles in San Francisco. There it would be most felt, owing to the great increase in mining values, for thousands of dollars are now required for stock margins where hundreds only were necessary a few months since. It is apparent that this money must come from somewhere, and it also will become apparent to the most casual reader that this demand was in itself sufficient to cause some slight embarrassment to the heavy operators. Banking institutions are quite numerous on this Coast, and it has always been the policy of the gentlemen who control them to accommodate legitimate business men when necessary. A rise in mining securities is in general the result of the largeness of the ore bodies in sight in the various mines called on 'Change, and so long as they remain undiminished they are taken as collateral security for the confidence reposed in their owners. Millions measure the daily transactions of the San Francisco stock board, or rather the boards, for there are two of them. They hold morning and afternoon sessions. All of the leading stocks, such as the Comstock, are called in the morning boards, while the less noted, though perhaps not least dealt in, are subjected to the whims and manipulations of the Bulls and Bears, in the evening boards. These are great and powerful corporations. The big board, as it is styled out of deference to its age and influence, is the leading one, though the operations of the little one are by no means of a restricted nature, yet, being but a small fish in the sea of mining brokerage, it will likely in time share the fate of those hapless minions of the deep that became gobbled up by the voracious monsters of their own species. Every nationality is represented in the old board, and one occasionally hears an intermixture of nearly every language spoken in the vernacular, and this variety of jargon, together with the din created by caller and bidder, is apt to bring to mind the story relative to the ambitious builders of the tower dedicated to Belus on the plains of Shinar. Our Sister Republic of Mexico has even its representative, in the person, it is said, of a lineal descendant of the illstarred Montezuma, thus linking the ancient civilisation of the Aztics with the more progressive, but not the more peaceful, civilisation of the Caucasian race. This may, however, be nothing more than an unmeaning canard, but such as it is I give it in illustration of the cosmopolitan status of the Queen City of the Pacific.

The season in which depressions in mining stocks generally occur is nearly upon us, hence the desire of most of the small operators to unload ere the fall takes place. The agricultural interests and products of California are but little inferior in value to the combined annual yield of the precious metals in Nevada and the first-named State. California is famous for the fineness of its cereals, and since the bulk is chiefly wheat, it follows that a great deal of money is needed for harvest purposes. It cannot be handled without incurring vast expense, consequently much of the cash invested in mining stocks has to be withdrawn and re-invested in wheat, barley, &c., in which it remains until the shipping season commences, when it is again gradually received back in the course of commercial exchange, to be again swallowed up in the all-devouring vortex of stock speculation. This, however, is one of the vices of the age, not to say of the country, and all Americans are noted for their fondness of the excitement arising from it. Plutus is often appealed to by the myriads who seek for his favours. He may be deaf as well as lame, for many of the applications, alas! are never answered. But, despite all of these things, men will hanker after the flesh-pots of Egypt, and in their eagerness to possess themselves of them will not hesitate to sacrifice the substance for the shadow in their wild pursuit after unearned wealth. Great are the temptations and the vagaries of fortune, and nowhere are their results seen to such advantage as on the Pacific Coast. There are few greater trials to which men could be subjected than to have them become the recipients of vast and suddenly acquired wealth. The novelty of the situation often leads, no doubt, to ludicrous acts of folly on the part of men who in their humble sphere of life did well enough, but who with the acquisition of riches gave way to every extravagance, and in the end degenerated into snobbish and mirth-provoking idiots.

One of the greatest benefits to quartz miners at the present juncture is the cheapness of quicksilver, which within the last few months has dwindled in value from $1·50 and $1·60 to $0·65 and $0·75 per pound. This decrease has given quite an impetus to quartz mining in this State. The same stimulus has been imparted to this industry in the other States and Territories of the Coast. These things will add largely to the product of the precious metals for 1875. The bullion product of the States and Territories west of the Rocky Mountains approximated to, probably, $90,000,000 for 1874, and when the various private channels through which gold and silver bars are transmitted from the mines are taken into account, it will be readily conceded that this amount is not at all too high. Wells, Fargo, and Co.'s agent at San Francisco, in his annual statement, placed the bullion yield of last year at $74,000,000, so that it will be no great stretch of the imagination to suppose that $16,000,000 more reached the various mints by private hands. Quicksilver heretofore has been a very heavy item of expense, now, however, owing to increased production and competition, it is obtained at greatly reduced prices. There have been many very valuable cinnabar mines discovered and opened within the past year, chiefly along the coast ranges of the golden State. Many of these are as yet but partially developed, and it is feared they will remain so too, if the monopolists who controul the situation should deem it to their interests to maintain the price of mercury at its present low standard. This rate was established with a view to deter the small dealers, whom circumstances brought forth, from entering the lists as producers. There appears to be no fear, however, that they will allow themselves to be driven from the field by the ring that has been formed to crush them. In the meantime mill and mine owners stand apart, and ardently offer up a silent prayer for the continuance of the struggle. Doubtless monopolists, "rings," &c., have been the scourge of the country, and the promoters of every species of rascality known to either the commercial or mining world. We have been ruined in both reputation and finances by the exactions of the one and the barefaced robberies of the other. We have had our Credit Mobilier ring; we have yet our gold rings, our wheat rings, our oil rings, our R. R. rings, our mining rings, and rings within rings, and now we have our whiskey ring to add to the iniquities of the past.

With such an array staring us in the face is it any longer surprising that we have been deprived of the confidence and capital necessary to the full development of the wonderful mineral resources of our State? One would hardly suppose so. But, notwithstanding our moral obliquities and numerous transgressions in mining and otherwise, Englishmen must not too confidently lay the fault of their mining losses to the acts of the people of this country. To do so would be an unmerited wrong. English mining speculators have been entirely too prone to the habit of attributing the disastrous consequences that have resulted from their own blunders, lack of caution and experience, to the swindling propensities of the people generally. Californians and Nevadans do not claim to be any more immaculate than are their cousins across the Atlantic. They have their failings, like other people, and are remarkable for their acuteness in driving a bargain in anything from which they hope to become gainers. This is natural. The day is, however gone by when a mining swindle would be looked upon with favour by the majority of the inhabitants of this coast. Such things are no longer considered as belonging to the order of smartness, and are, therefore, discountenanced by every honourable and upright citizen. True, there occasionally crops out some job of doubtful propriety, but the moment it is understood it is denounced by the people and press alike. American capitalists—even San Franciscans—have suffered as much from the rascalities practised upon them by the mining sharps of the Coast as have the London people by the bursting of the gilded bubbles they have themselves been partly instrumental in creating.

Whom besides an English company would pay the ruinous price of $5,000,000 for the now collapsed Emma? Or who, also, besides an inexperienced Briton would have believed the wonderful accounts that were from time to time industriously circulated in London and elsewhere regarding the reputed wealth of that mine? There will, however, have been some good derived from past lessons if we are but wise enough to rightly apply them in all future undertakings.

Tybo County, May 29. J. D. POWER.

THE MINERAL RESOURCES OF CANADA.

SIR,—Your correspondent, "Actuary" (see Supplement to Journal of Feb. 13 under this head), and others desirous to see the mineral resources of Canada developed may be interested to learn that the suggestion of forming a Dominion Mining Corporation has been anticipated in all but the name and suggested mode of direction by the establishment last year of the CANADIAN MINES BUREAU.

Beyond seeking legislative recognition by Charter from the Dominion, it has already received one from Nova Scotia. This organisation deprecates all governmental interference, and anybody familiar with the Provincial Mining Laws or the progress of the Intercolonial and Pacific Railways, or the mal-administration of the Nova Scotia Gold, Land, and Crushing Company, which had for managing director the then provincial treasurer—a Mr. William Annand—must admit that a directorate of Canadian politicians, of the stripe now in office, would neither inspire local confidence nor afford foreign investors any guarantee against jobbery and mismanagement. An executive of leading business men and mine-owners, having their own credit and interests at stake, as is proposed for the Bureau, is the only one likely to conduct such an undertaking to the advantage of all concerned. ACADIENSIS.

Halifax, N.S., June 1.

ABSTRACT OF GOLD YIELD IN NOVA SCOTIA—1860-1874.

DISTRICT.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.
	Ozs.	£.	Ozs.	ozs.	Tons.	oz. dt. gr.	s. d.	No.
Sherbrooke	69,147½	272,590	65,109½	38	84,283¾	17 21·6	11 5	460,274
Waverley	48,135¾	192,543	45,135¾		80,648	13 1·8	6 10¾	549,484
Renfrew	27,012½	108,050	27,0 2½		36,207½	16 14·1	8 2	262,730
Wine Harbour...	23,575¾	95,503	23,575¾		32,764	15 19·5	9 1	203,294
Montague.....	16,519	62,076	15,519		6,473	2 13 16·9	8 0¾	153,894
Oldham	14,870	59,480	14,870		16,168	1 0 11·1	6 2	191,594
Tangier	12,145¾	48,581	11,686¾	458½	15,327¾	16 15·3	4 0	230,829
Stormont	10,728¾	42,915	10,710¾	18	11,070¾	1 1 1·5	5 10	143,052
Uniacke.....	8,122½	32,490	8,122½		12,318	14 18·4	8 2	79,560
Caribou	2,715½	10,862	2,715½		3,539½	17 4·4	7 11	27,404
Ovens	2,292	9,168	281	2011	169½	17 9·9	3 4½	10,425
Unclassified	1,536	6,144	979¼	556¾	2,665¾	8 3·0	2 6½	48,178
Gay's River	1,221½	4,886	—	1221½	—	3 6·1	10 9½	9,043
Laurencetown...	542	2,168	491¾	50¾	670¾	14 17·6	1 10½	19,006
						Mean.	Mean.	
Total.....	236,864	947,546	232,509½	4354½	302,305¾	16 19·6	7 8½	2,397,772

I.—Total gold yield, 1860-1874 inclusive.
II.—Value at 4*l*. average per oz.
III.—Yield from quartz.
IV.—Native gold, the amount from Gay's river being derived from crusher cement, the remainder from alluvial washings.
V.—Quartz crushed, 1862-1874.
VI.—Average per ton for that period.
VII.—Daily average per man same period.
VIII.—Total number of days' labour same period.

NOVA SCOTIAN MINING NEWS.

Owing to the severe monetary pressure which has affected all the Canadian provinces since January, and the difficulty of procuring foreign capital, mining is not very active this year. The coal trade of Cape Breton languishes for want of ready markets, and the gold industry is decaying on account of the exactions of the Government and the discredit thrown upon the country by the failure of undertakings launched under *quasi* official guarantee. Such gold mines as are being worked continue to give satisfactory returns; but, as steadily remunerative employment offers on the railways and other public works, the men leave the gold districts, and a scarcity of labour will be felt should gold mining revive.

Perhaps the most important enterprise in the Province just now is that of the Steel Company of Canada, whose works at Londonderry, are making wonderful progress, promising to become in extent and evidences of permanency a second Creusot.

Mr. SELWYN, director of the Geological Survey, has already started for British Columbia, Prof. BELL has left for Manitoba, Prof. ROBB and Mr. HUGH FLETCHER are engaged in Cape Breton, and Dr. MURRAY continues the Survey in Newfoundland, from which latter place confirmatory reports have just been received of the richness of the copper mines opened last autumn at Bett's Cove.

Halifax, N.S., June 1. ACADIENSIS.

NEW ROSARIO MINING COMPANY.

To the Unfortunate Shareholders, with myself, connected in the New Rosario Silver Mines, in Mexico,—I beg to call your serious attention to the translation herewith from the Spanish of a protest against the management, sent me by sundry of the bar or free shareholders, showing how detrimental his services have been considered for their and our interests and prosperity.

On the 5th inst. I addressed a letter to Mr. Goodson, the Chairman of the company, enclosing to him for the board a translation of the said protest, and asking for his advice how I should act under the circumstance before appearing in public, to which he has not made me any reply, or indeed taken any notice of it. I deem it, therefore, a duty, for my own justification toward you and our unfortunate *confreres* in Mexico, to request the Editor of the universally-read *Mining Journal* to be so good as to insert this letter and protest for your information as well as for that of the public in general.

South Wales, June 15. R. F. G.

[ROUGH TRANSLATION.]

To the Directors and Shareholders of the New Rosario Mining Company,—The undersigned owners of the mines and holders of free shares in the New Rosario Company have to make known to you that the way in which the business of this concern is managed is not satisfactory nor conducive to our interests.

It is well known that for more than two years ore has been in sight, and abundant the produce, which would have been sufficient for this concern to prosper and give dividends to all parties interested. Not to have made use of this advantage is a thing that neither ourselves nor the public in general can understand, and now that Mr. Cumins has returned to Europe we consider the opportunity good for putting a more capable person in his place to direct the negociation or management as we believe that it ought to be directed.

It would be futile to allege the want of places where the ore might have been reduced, as it is notorious that there are many large establishments idle for the want of occupation of that nature.

To our sorrow and injury we have to lament this bad state of things, and we hope that when you receive this you will take into consideration our complaints, and adopt the necessary remedy.

Our interests which during the last two years ought to have increased considerably in value have in consequence of the management we have to complain of become of less value every day.

[Here follow the Signatures in the Original.]

Mexico, April 26.

CAPE COPPER MINING COMPANY.

SIR,—Last week's Journal not having your usual summary of the monthly report issued by the directors on the 12th inst., perhaps it would be well to compare the working of the four months ending April 30 with the same period of last year, as taken from the directors' monthly reports:—

1875—January .....Tons	893	1874—January .....Tons	659
February	903	February	695
March	944	March	708
April	1000	April	781
Total	3745	Total	2843

Showing an increased yield in the four months of 902 tons, or at the rate of 2706 tons per annum.

It will thus be seen the steady increase in the yield of the company's mines, and that the output now is at the rate of 1000 tons per month. It also appears that the copper ore is now with the new machinery dressed to the extent of about 1050 tons a month, of which the heretofore non-productive surface reserve contributes 100 tons a month.—*London, June 15.* AN INVESTOR.

CAPE COPPER MINING COMPANY.

SIR,—Amongst all the dreary list of mining companies there is one that stands pre-eminent, not only as a great success, but for its admirable management by Messrs. John Taylor and Sons. Here we have a board of directors who on arrival of the mails immediately send to each shareholder a straightforward detailed account of all the operations going on at the mines. There is nothing concealed there, nothing withheld, nothing to lead to any suspicion of any jobbery there, rampant as it is in the shares of many other mines I could name. Great as has been the success of this company (mine is a misnomer, as they hold a vast territory with rich ores cropping up in all directions), I prognosticate a much more brilliant career for the company in almost the immediate future. When the railroad is finished in a few months the expenses per unit of ore will be gradually reduced from 10s. the unit, as it stands now, to 9s., and even to 8s. the unit, and a saving of 1s. the unit means a gain to the shareholders of 1*l*. per annum in their dividend on the present raisings, which are now 1000 tons per month, and which will go on gradually increasing. With copper at 90*l*. the dividend would be at least 6*l*. per share, and the 4*l*. now paid quite a minimum to be depended upon.

I have heard it stated by a Cape merchant that the Government, having sent an eminent geologist to view the territory over which the company hold sway, has said in his report that the copper deposits are quite extraordinary, the ores incredibly rich, and that in his opinion their value in the future would quite throw into the shade that of the gold and diamond fields in other parts of the colony. Let no one part with their shares. They are a wonderful property, such as they may seek in vain elsewhere, and what I here say will be confirmed at the approaching annual meeting. I venture to say that next year this company will be able to lay down copper at Swansea at 45*l*., if not at 42*l*. 10s., per ton. Chili mines would starve and shut up with copper at 70*l*. here for any length of time. A brilliant future is in store for the adventurers.

London, June 14. A SHAREHOLDER.

THE RICHMOND AND THE ST. JOHN DEL REY MINES.

SIR,—Whether the correspondent writing under the cognomen "St. John del Rey Mine Shareholder," in last week's Journal, is the same person who wrote down the Richmond Mine I do not know nor care; but the purport of the letters is the same—the depreciation of the Richmond shares. So let shareholders beware, and when they feel uneasy I recommend them to read the prognostications of Mr. Clarence King, the United States Geologist, and also the reports of Mr. Probert and those of our directors, when the aim of anonymous detractors will become apparent.

The Chairman of the Richmond, in his speech to the shareholders on the 20th ult., says—

"You will have had by the end of this month 2*l*. 14s. returned to you upon each 5*l*. share; add to that the fact that we have already earned over 1*l*. a share more—*i.e.*, 3*l*. 14s.—and in the next six months the mine will have wholly cleared itself of its original cost."

A tolerably substantial corroboration of Mr. Clarence King's report of Feb. 10, 1873, wherein it appeared that all the Ruby Hill Mines, within which is the Richmond, are on one large bed vein, and that there was ore developed in the Richmond to the value of 757,000*l*. He goes on to say that—

"It is very rare in the history of American mining that so valuable a reserve has been developed with such insignificant work within such small compass, or so near the surface: that it is only a portion of an immense deposit seems all but absolutely certain. The value, therefore, of your property is no longer problematical, but is ascertained for, at least, several years ahead."

This prospection was revealed in 1873—it has been more than verified. If in the face of that "bears" and "bulls" and such like animals can terrify shareholders into parting with their shares, they must not complain that their fears were engendered by any lack of reliable information. I, for one, shall not be so influenced. Our net

revenue will be increased this half-year from 20 to 25 per cent. on account of the economies effected by the erection of our own refining works.

The net revenue for the last half-year was about 80,000*l.*, and I calculate that it will be 100,000*l.* for the current half-year, out of which we shall put 25,000*l.* to the reserve fund, and we shall spend upon hoisting machinery, &c., about 5000*l.*, which will leave 70,000*l.* for dividends. A dividend of 1*l.* 5*s.* a share for the half-year will absorb 67,500*l.*, leaving a balance of 2500*l.* to carry forward, and 50,000*l.* in the reserve fund.

RICHMOND CONSOLIDATED MINE SHAREHOLDER.

THE RICHMOND—ST. JOHN DEL REY.

SIR,—Your correspondent, "A St. John del Rey Shareholder," cavils at an expression of mine—"a higher rise;" surely an advance of 4*l.* per share is a high rise, and 6*l.* a still higher rise. I had not the slightest intention to depreciate the St. John del Rey, I only adduced it as an instance of the capriciousness of public opinion, which estimated the one property at double the relative market price of the other, the advantages preponderating in favour of the lower priced stock.

Your correspondent demurs to any comparison between the St. John del Rey and the Richmond on the ground that the former is a gold mine, the latter a silver-lead mine. It is true the St. John del Rey is purely a gold mine, with an average yield, I believe, of 8*8* per ton, but I see by the last return in your Journal that the average yield in gold per ton in the Richmond is now $37, and together with the silver and lead is worth per ton about $100. It is, therefore, as I heard Mr. Probert say at the meeting last November twelvemonths, "a gold mine embedded in a silver-lead mine." The last return of gross produce of the St. John del Rey is I see 19,068*l.*, the Richmond I believe during the same period is about double, and yet its stocks remains at about half the relative price of the St. John del Rey. Certainly a very singular anomaly. A. H. WESTAWAY.

Austinfriars, June 16.

JAVALI AND CHONTALES MINES.

SIR,—Your correspondent, in last week's Journal, is in error in thinking that the Javali directors are in receipt of 500*l.* a-year, the fact being that at present they receive no remuneration at all; under the Articles of Association they are entitled to 1000*l.* per annum, commencing from the date of the incorporation of the company, whenever an average dividend of 5 per cent. shall have been paid to the shareholders from the same date, and to double that amount—2000*l.*—in any year in which a dividend of 20 per cent. shall have been paid. I write this letter not so much to correct your correspondent, but rather as a reminder to my brother shareholders in the Javali Company that the Articles of Association have not yet been amended, and that the above extravagant scale of remuneration is accumulating. It is true that we must first increase at least 40 per cent. (as the company have been in existence eight years) before the directors can take anything, and before that happy time arrives I feel sure we shall be able to set our board in order if we combine not to re-elect any of the present directors according as they retire in rotation unless the Articles of Association are changed, so that their remuneration shall be assimilated to the moderate but sufficient sum with which, according to your correspondent, the directors of the sister company are content, or in the absense of such change we obtain from each individual some satisfactory assurance as to his views and intentions with regard both to the accumulated thousands and his future payment.—*June* 15. ANTI-SINECURE.

GOLD IN NORTH WALES.

GOLD COMPANY (LIMITED) *v.* CLOGAU GOLD COMPANY.

SIR,—The Gold Company (Limited) was formed about two years since, with a capital of 100,000*l.*, and a large portion of the amount was given to vendors in fully paid-up shares; 30,000*l.* in cash was expended in machinery and opening up the mine.

With these remarks I will now say a few words about the Clogau Company (Limited). The original shareholders in the Gold Company fancied that by spending some money in exploring this "Old Clogau Mine" that some good might result, and well have they been recompensed by opening up a splendid body of gold ore, yielding very large returns; hence a private company has been formed in Sheffield, with a capital of 25,000*l.*, in 1*l.* shares fully paid, which are now worth from 3*l.* to 4*l.* each, and when the proper machinery (now in course of erection) is finished, and under honest, sound, and experienced management, these shares will probably go to 10*l.* per share, or even higher.

In this mine there is no humbug. Visible gold can be seen in nearly all the formation; no one can say how long it will last, but as gold mines always last longer than silver ones, we may fairly expect we have now entered upon a new era of geology in North Wales. No doubt some readers will say these very same gold mines were worked 15 or 20 years ago. Such was the case, but since that time the gold development of the world has created a new class of engineers, and has brought forward an entirely new description of machinery, which has been the means of producing millions sterling out of the mines of Australia and America, and which we hope may be the case in this country. One thing is certain, that some of the shareholders in this Clogau Company have many times visited the property, have freely paid their deposits, and cheerfully await the results. I may further add that one or two of the directors are highly practical men, who will not be misled by any American adventurers that may offer, but will engage none but educated and scientific men to superintend this property, which bids fair to yield immense returns in a few months. DOLGELLY.

GOLD MINING IN WALES.

SIR,—Many of the numerous readers of the Journal believed that all the gold mining in Wales consisted in the name only, that where a fair trial was given the result in most cases was very satisfactory. However, everyone who is interested in mining will be glad to find how flourishing things are in the neighbourhood of Dolgelly now. When on a fishing tour to that part the other day we were very much surprised to see and hear what we did. In the first place we went to a comfortable little hotel, called Tyn-y-groes, situated on the banks of the river Mawddach, about five miles from Dolgelly. Here we met with three gentlemen who had had experience of gold mining in Australia, California, &c., for many years, and from what they have seen here they are fully convinced that it is nothing but folly for any gold enterpriser to go abroad, when he has better chances of making a large fortune at home. These gentlemen testified to us that they have seen as rich specimens of gold from Merioneth as they ever did from anywhere abroad. From this hotel we went above the waterfalls of the Cain and Mawddach. About half a mile above the falls we came across the mine called Cwmheison, which has the appearance of having been worked some years ago, and where work is to be resumed very soon. A little lower down is the Gwynfynydd Gold Mine, which, we were told, is one of the richest in the district; this, we understand, has been lately bought, the purchaser first having had the privilege of trying it, and, the result proving very satisfactory, work is to be commenced at once. The plant belonging to this mine is fixed on the junction of the Rivers Cain and Mawddach, and under the falls, where any quantity of water can be got with the greatest ease. As we came along we passed the Tyddyngladys mines; these, we believe, have been chiefly worked for lead. Having passed this we saw what we never expected to see in Wales—alluvial gold washing. This reminded us strongly of California in years gone by. An old experienced miner, called Cornelius Owen, holds a piece of property called Penrhos; this lies between the River Mawddach and another that we do not happen to know the name of. Here Cornelius is to be seen daily with his cradle on the banks of the river, washing the gravel with very good profit; we saw nuggets with him weighing from 7 dwts. down, but it is only a fair inference to draw that all the properties about there are not so rich as Penrhos, for Cornelius being an old miner, who had lived on the spot nearly all his lifetime, would be a likely man to know where the best place is. It would undoubtedly prove a boon to the district if he were to get a company formed, and work the property on a large scale. PISCATOR.

MINING AT COMBMARTIN, NORTH DEVON.

SIR,—In reply to "Cornubiensis," I beg to state that the data I have given are correct, and the lodes converging towards each other will meet at about 7 fms. deep. He had better make another calculation, and see if he cannot now come to a like conclusion. I am obliged to him for the complimentary manner in which he writes, and would have been better pleased if such a "Censor" had the courage to let one know his name and habitation. To obtain his advice sometimes might be desirable and beneficial.

A little learning is a dangerous thing, and my friend's seems to trouble him somewhat by causing him to try to find fault unnecessarily. Let him with all diligence add to what he has already attained, and then, perhaps, when he finds an error he may be to that fault a "little kind," instead of mingling with his remarks so much sarcasm. A loose and hasty way of finding fault is as much to be deprecated as a loose way of stating facts, and should, therefore, be carefully guarded against, as it tends to lower the fault-finder in the eyes of right-minded people. No practical man would talk of fractions of inches with regard to the convergence of two lodes, because all practicals know how tortuous most lodes are, both in their dips and courses. JOHN TREWEEK.

[Mr. Treweek has forwarded a section drawn to scale, which fully confirms the accuracy of the statements in his letter in the Supplement to the Journal of June 5. The northernmost lode dips south 5 ft. per fathom; the southernmost dips south 2½ ft. per fathom. They are 3 fms. apart at surface, and, consequently, will run together at a depth of 7 fms. "Cornubiensis" should put down the lines on paper, which can be done in two minutes. It is, no doubt, inaccurate to describe the two lodes as dipping towards each other, but practical men usually so describe them. They are really two lodes dipping the same way, but with a different underlie, and such lodes must come together in depth, although necessarily at a greater depth than if they were really dipping towards each other.—ED. *M. J.*]

CORNISH MINING.

SIR,—Although, I believe, many people seem to imagine that Cornish mining is on its last legs, and that it is tottering to its fall, that gloom far denser than ever yet has been experienced is to overshadow the county, and suffocate its energies, the imagination is strangely deficient in a shadow even of truth. The causes of the depression are apparent, the results are patent to all. The past has been bitter; the future will be bright. This fact has been proved, that Cornish mining has reality enough to last many a dreaded depression, and that when the industries of Cornwall fail Britain will no longer be anything but a shadow of itself. We have seen the iron trade almost collapse, whilst Cornish mining holds up its head alive. Never before has such a depression been experienced—1866 was a joke to it. Indeed, the very existence of Britain's greatness and wealth might almost be doubted. Tin is low, but money is plentiful; match one against the other, and back Cornish mining for a rise. Investment now must well repay. Standard mines must rise in value, dividend mines prove doubly prosperous. Dolcoath, father of tin mining, still stands prominent. There are riches inexhaustible; treasures untold lie heap upon heap, and wealth awaits the gatherer. Invest, and reap the benefit. The deepest level is the richest, not only in the mine, but in the county. Old dividend mines are sure, most others are questionable.

West Basset is one of the most promising mines now. Lack of stamping power hindered heretofore, but now, this difficulty surmounted, profits are expected. The holders of West Basset are sure and steady, and three-fourths of the mine is in the hands of those who are prepared to stake any amount on the success of the concern. The management is very largely interested, and this is a good sign.

South Crofty is the mine of this year. Rising steadily from a state of prosperity when tin was higher, powerful stamps were erected, and preparations made for greatly increased returns. After a large outlay has been thus made the reaping time has come. For several years the junction of the south lode with Beckford's lode has been looked forward to as the great point on the mine. More recently the East Pool lode has excited a good deal of interest. This has, after many months of weary cross-cutting, been cut into, and has quite doubled the value of the mine, for this lode runs throughout the sett back into the virgin ground unworked below the 36, where an elvan course cut off the former lode. The junction of the lodes is a grand point, and I think shares will be very tightly held. A CORNISHMAN.

[For remainder of Original Correspondence, see to-day's Journal.]

NOTES ON FOREIGN MINING LAW.

There is a remarkable dissimilarity between the law of England and that of most other European countries with regard to Mining. In this country the right to the minerals under the soil is almost universally associated with the right to the soil, while on the Continent these two rights are as uniformly dissociated, or separated, to a greater or less extent. We purpose in this paper to give short abstracts of the Law of Mining at present in force in the principal countries on the continent of Europe. These abstracts may be expected to be of considerable value, not only to the numerous class of persons who have a pecuniary stake in foreign mining enterprises, but also to all who are interested in the questions now so keenly discussed relating to the ownership of the soil and of the mineral treasures concealed under it. The mining laws of the principal continental countries offer solutions, agreeing in the main, though differing to some extent in details, of the problem how these mineral treasures are to be turned to the best account for the good of the community.

FRANCE.

The French Law of April 21, 1810, divides all minerals into three classes, and refers them either to *mines*, *minières*, or *carrières*, of which the first class embraces such minerals as are subjects for concession—that is, which may be worked by those who have obtained a public concession for that purpose, even in ground belonging to others. To this class belong not only all metallic substances, among which the law specifies gold, silver, platinum, mercury, lead, iron when it occurs in veins or beds, copper, tin, zinc, calamine, bismuth, cobalt, arsenic, manganese, antimony, molybdenum, and galena, but also sulphur, coal (*du charbon de terre ou de pierre*), fossil wood, bitumens, alum, and sulphates, with a metallic base.

The second class, *les minières*, embraces alluvial iron ore (lake and bog ore), pyritous, earths, adapted for the manufacture of green vitriol, earths containing alum and peat-mosses. For right to work the three first-named varieties the special permission of the Prefect is required. The owner of the soil has a preferable claim to this permission, but if he is not disposed to work them the right may be given to another party, under certain conditions. Peat-mosses cannot be worked by anyone other than the owner of the soil without his permission.

Les carrières embrace slate, sandstone, building and other stone, marble, granite, limestone, gypsum, pozzuolana, trap, basalt, lava, marl, chalk, sand, flint, clay, kaolin, fuller's earth, china-clay, all varieties of earth and sand, together with all pyritous earths which may be used as manure. These all belong to the owner of the soil, though in certain cases, when they are wanted for common or public purposes, they may be worked by other persons, with compensation to the proprietor of the soil.

Whoever is desirous of instituting a search on ground belonging to another, with a view to discover and expose any mineral belonging to the first class, *les mines*, must obtain permission either from the proprietor of the ground or the proper authorities.

A permission to search for minerals, or a concession to carry on mining, does not entitle the holder, *without the permission of the owner of the ground*, to carry on any exploring work, or open a shaft or adit level, or set up machinery, &c., in any place enclosed with a wall, in any yard or orchard, or at a less distance from a dwelling house, or place enclosed with a wall, than 100 metres. The law does not forbid work being carried on under ground within the limits thus imposed, but requires the mineowner to give security for any damage that may arise, even without anyone being to blame.

The right to carry on mining, which may be held by a foreigner as well as a native, depends upon public concession. The owner of the ground, therefore, when he wishes to work a mine in his own ground must first obtain a concession, to which he has no preferable claim. In case two or more separate individuals make application for a concession of the same discovery, the proper authority has the power to decide who has the preferable claim, be it the owner of the ground, the discoverer, or any other person. The discoverer, however, when the concession is given to another, is entitled to compensation, the amount of which is determined when the concession is granted. The owner of the ground is also entitled to a royalty, or payment, proportioned to the yield of the mine, which is determined at the same time, and is considered as pertaining to the ground, and liable along with it for any mortgage. The owner is besides entitled to compensation for the ground occupied during the work of exploration, which compensation when the permission is for a short time is reckoned at double the produce of the ground, but otherwise at double its value.

The law does not require any certain result of exploration work as a condition for obtaining a concession, but, on the other hand, the applicant must show that he possesses sufficient means for beginning and carrying on the work of mining, and for paying the royalties and compensation which have been fixed.

The size of the concession is determined by the expressed desire of the applicant, where no obstacle occurs, subject to the approval of the authorities when the concession is granted. Underground the boundary of the concession is perpendicular. Several concessions may be united on condition that work is carried on in each. The law contains no provisions with reference to the amount of work required to protect the concession, and prevent it from lapsing.

The concession confers perpetual ownership in the mine, which is considered as real estate, and is liable to all the provisions of the law relating to such property. The owner, besides, cannot sell the mine in divisions or shares without the permission of Government.

By means of mining engineers, under the proper minister and the Prefect of the department, the State exercises a supervision over mining work, for the protection and security of buildings, of the surface, and of the men employed. The French law, when enacted, was in force in Belgium, and still is, with certain modifications.

AUSTRIA.

By the Austrian law, promulgated May 23, 1854, everyone who can hold real estate has a right, with the permission of the mining authorities, upon his own or another person's ground, to search for and work certain minerals, namely—1. Such as are adapted for the production of metals, sulphur, alum vitriol, or common salt.—2. Water cement, graphite, and bituminous matter.—3. All kinds of black and brown coal.

If any person, with a view to search for such minerals, wishes to commence work on his own or another person's ground, he must obtain the permission of the mining authorities, who have the power to set apart for the applicant a certain area of considerable extent wherein he may carry on operations. Such permission is not granted for a longer period than one year, but it may be renewed annually, provided the work has been begun. Before beginning the work of exploration the explorer must either come to terms with the owner of the ground, or apply for the special permission of the authorities to begin work within the area assigned him, in which case he must deposit security for any damage which may be caused to the owner of the ground. No exploration work can be carried on without the consent of the owner of the ground—

a.—Within a dwelling house, or other building.

b.—In an enclosed yard.

c.—In a fenced orchard or park, a burying place, or an area surrounded by a wall.

d.—At a less distance than 20 klafter (about 125 feet) from places denoted by *a* and *b*.

For carrying on work with certain areas mentioned in the law, which are set apart for common use (roads, railways, &c.) the permission of the authorities is required.

Permission to search does not confer an exclusive right within the assigned area, but such a permission may at the same time be granted to several persons to explore either one and the same area. An exclusive right to carry on exploration within a defined field (Frieschurf) arises first from the applicant fixing on a certain point for beginning the work, when he is protected within a circular area with the point fixed on as its centre, and with a radius of 224 Viennese klafter (about 461½ yards). Every Frieschurf commonly confers a right to at least a single concession (Grubenmass) of a rectangular form, and with an area of 12,544 (224×56) square klafter, and in the case of coal to at least two such areas, with two of the long sides touching each other (Doppelmass). The concession extends "in der ewige Höhe und Teufe." If the shaft is 40 klafter (about 250 ft.) deep the explorer has the right in general to two, and in the case of coal to four, contiguous areas. When several areas are included in one concession it is called a mining field (Grubenfeld). Only this number of areas can in general be included in one concession. But if there is unclaimed ground available, the applicant may obtain, in the case of black and brown coal, four double, and in the case of other discoveries, four single areas of the size stated above, the extent in the former case being equal to that of a square with a side of about 1971½ ft., and in the latter with a size of about 1384 ft. The throwing together of separate concessions, or mining fields, is permitted when they border on each other, or when, in consequence of the union, the mining can be carried on more advantageously.

The persons who carry on the work of exploration, or mining, within a defined area have a right to use only so much ground as is required for their operations. They have a right to the use of the ground on giving compensation, but if it is required for a considerable period the owner may compel them to purchase it.

In order to obtain a concession, which is granted by the proper authorities, it is necessary that some mineral of the specified kind be exposed (aufgeschlossen) within the area applied for, and that the discovery be considered worth working in the circumstances of the locality. When there are several applicants for a concession of a field the first applicant has the preference. If several applications are made on the same day all the applicants have the same right. The holders of permissions to search in areas with fixed centres (Freischurf) are by special enactments protected against applicants for concessions in their vicinity.

The existing law, like that now in force in Germany, does not recognise any right founded on the ownership of the soil as belonging to the proprietor of the ground to take part in the mining, or otherwise enjoy a share of the yield. He is only entitled to compensation for the ground which is given up, and for damage and disturbance. The mineowner has exclusive right within the area conceded to him to turn to account not only that mineral on the ground of exposing which he obtained the concession, but also every other mineral, which may be the object of a concession, which occurs within the area granted to him. Of other minerals found there he can take, free of expense, as much as is required for the carrying on of the mining, and of metallurgical processes connected therewith, but the rest he is obliged to offer to the owner of the ground, being entitled, however, to receive from him the cost of extraction and of bringing to the surface. In case the latter does not within four weeks avail himself of his right, this product also falls to the mineowner.

With reference to the work necessary for protecting the right to the mine, it is ordained that on every area on which exploration may be carried on, on every concession or mining field, a number of workmen proportioned to the nature of the place and the purpose of the work must work eight hours every working day. If the mineowner fails to comply with the requirements of the law, without having obtained permission to stop working, the consequences are fines in the first place, and finally the loss of his right to carry on the work of exploration or mining, in which case the mine, after certain formalities, passes from his ownership, and may be handed over to another person. An action against a holder of Freischurf for neglecting to satisfy the requirements of the law may be brought both by other explorers whose right of exploration is diminished by the Freischurf in question and by the owner of the ground, who is thus needlessly prevented from using his ground.

[*To be continued in next week's Journal.*]

CAMP FLOYD.—We are informed that the Queen of the West Company, who have leased the mill of this company for a year, entered on possession on April 15 last, and have commenced the reduction of the tailings for the benefit of the Camp Floyd Milling and Mining Company in terms of the arrangements. These tailings have been carefully sampled, and are estimated to yield a good profit.

Meetings of Public Companies.

SKERNE IRONWORKS COMPANY.

The ordinary general meeting of shareholders was held, on Tuesday, at the City Terminus Hotel, Cannon-street,
Lieut-Col. F. D. GREY in the chair.

Mr. J. S. C. SUTHERLAND (the secretary) read the notice calling the meeting. The report of the directors was taken as read.

The CHAIRMAN said, before moving the adoption of the report, he would make a few remarks in extension of that report. As he had said, the report was short, but, taken in connection with the balance-sheet attached thereto, he thought it very accurately defined not only the working of the company for the year, but also its position. The shareholders would have observed that after having allowed for the working expenses both at Darlington and elsewhere, and making provision for a couple of bad debts that they had unfortunately incurred during the year, there was a net profit realised of close upon 12,000*l.*—in other words, nearly 6 per cent. upon the capital of the company. Unfortunately, the accounts also showed them that which they all knew before—that they had commenced the year with a very considerable deficit, which this balance of net profit had not been wholly able to meet, and, therefore, the shareholders were again without a dividend. That deficit was an old story, and therefore there was no occasion for him to go into it that day; indeed, the circumstances had been, during his unavoidable absence last year, so lucidly and ably put before the shareholders by his learned colleague, Mr. Lloyd, that there was really nothing left for him to say. He had been sorry to observe on reading the report of the meeting that that explanation, which had been so very straightforward, had not been received in a very generous spirit. He made no allusion to the criticisms on himself—he might call them personal attacks—because he believed that attacks of that sort on an absent person, and also introducing, as they did, matters that were not before the meeting, were not only ungenerous, but certainly unbecoming, and as such reflected very much more, in his opinion, upon the character of the critics than on the criticised. The meeting must not think for a moment that he deprecated criticism. He thought that the acts of all public men should be criticised, and he thought that such criticism was not only justifiable, but wholesome. So wholesome did he deem it that he proposed now to consider that the directors were there on their defence, charged with having by mismanagement produced a result disproportionate to the means and capital employed by this company. He was bound to say that part of the charge must be admitted at once—that was to say, that the result was disproportionate to the means and capital employed. But then, the question was entirely whether that had been occasioned by want of management or mismanagement on the part of the directors, or by extraneous causes over which they had no control. He thought he should be able to show the shareholders in very few words that at any rate it was no fault of the management. At the time they had acquired the property the output of the works had risen to about 22,000 tons of plate per annum. It was proper that the shareholders should expect at any rate that output in the future. Now, assuming them to have had that output the past year, the average price at which plate iron sold during the twelvemonth having been about 10*l.*, they would have received a gross sum for their plates of 220,000*l.* Well, they had received 250,000*l.*, therefore it was very clear that 30,000*l.* had been made above what they might have reasonably expected to realise. That must have arisen from some cause which could hardly be called mismanagement. If the sum realised had been less than 220,000*l.*, then, probably, the shareholders might have considered the charge proved against the directors of incapacity; as it was, he thought quite the reverse must be shown. This result had been obtained by three causes he might say. First, the policy of the directors, which had been condemned by at least one speaker at the last meeting, of having increased the capacity of the works during a depressed period. He could show the shareholders very shortly that that had been very good and sound policy apart from the result, but as the result had shown it to be good he thought it unnecessary to intrude particulars. The second and main feature that had helped this result had been the energy and zeal and the intelligence shown in the local management of the works. He could not speak too highly of that. Both of the auditors were present, and could testify to what he said—that it was the opinion in the North of England that there had certainly been no more successful management, as judged by the results, than that of the Skerne Ironworks Company. The third cause that had produced this result was strict economy—economy bordering on parsimony. Indeed, but for the peculiar circumstances in which the company had been placed last year, caused by the unfortunate position of the iron trade and their own losses, their economy would have been unjustifiable, and he thought it would be unjustifiable to continue it. The expenses of their London office were a great deal too small, and would 'have been unjustifiable under any other circumstances. Although he was not thinking of himself and his colleagues when he spoke, he might mention here that the directors had again this year consented to forego a moiety of their remuneration. The principle involved in that he did not think good at all. The shareholders must be well aware that when things were working badly the labours of the managing body were not diminished, while their anxiety was considerably increased. However, they had felt that it was impossible for them to enforce strict economy without themselves setting the example. And, therefore, the board had foregone for the second year a moiety of their remuneration—he hoped for the last time. If, then, the management had not been at fault it was clear that it must be from some extraneous cause that they had not made as much money as they had hoped to do. Every gentleman present would, he thought, understand exactly how that was. The complaint was not confined simply to the iron trade, but in every department of the country's industry the same tale was told that the results of the past year had been disappointing. Moreover, it was not only in England but in Europe and America—in fact, all over the world, that everybody was making an outcry about the falling off in the profits realised. He could inform the meeting from personal observation and knowledge that the iron trade in Belgium and Germany was in as depressed a condition as in this country. Now, so far as the foreigners were concerned, there was this consolation in the fact of universal dulness. It was quite clear that the iron trade could not continue as it was. They must either lose the trade entirely from the country or they must make a profit out of it. He quite understood people thinking that the trade was going from them, but from what he saw abroad he was inclined to think that the foreigners were not in as good a position as they in this country were, and that a revival of trade would be felt by themselves even before their neighbours. In regard to the balance-sheet, he wished to point out that the shareholders would find in some of the items a few matters mixed up as it were. He would ask the meeting not to have them separated in public for this reason; the company had, of course, many and keen competitors, and it was, therefore, scarcely politic to divulge such matters in public. At the same time shareholders were at liberty to call at the office of the company, where all and any particulars would be given them. He had only further to allude to the modified form of local management under which they now existed. Mr. Hutchinson had found it necessary, in consequence of leaving Darlington to give up his position as local manager, but he had, he (the speaker) was happy to say, consented to remain with the company, and give his services as director. Mr. Pratt had consented to continue the arrangement there, and the board had also entered into a fresh contract with the works manager, who, he should mention, had been of the greatest assistance to the company at the works; indeed, he was a very valuable man. The Chairman then concluded by moving, "That the report and statement of accounts be adopted, and entered on the minutes."—Mr. J. H. LLOYD seconded the motion.

The CHAIRMAN, in answer to questions from Messrs. Face, Pellett, and other shareholders, said, as to the question why they, being in debt, were putting by 2000*l.* to reserve, that he thought it essential in all companies, and particularly in this, where all the shares were paid up, that there should be a reserve. In the iron trade great progress was being made in the way of inventions. At the present moment two important inventions were being tried by leading firms, which if successful this company would be compelled to adopt. Therefore, it was absolutely necessary to have a reserve fund. The money was invested in the company's business, was perfectly safe there, and carned a better interest than if placed in Government securities. As to the amount of bad debts yet unrecovered, after taking credit for the sum they said they should recover last year, there was just 700*l.* owing—in other words, they had recovered more than they had said they should, and they now hoped to get some, if not all, of that 700*l.* As to the removal of the London office to Darlington, this was a company the head-quarters of which were in London, and, therefore, they could not be held anywhere else. At the same time, if it were the wish of the majority of the shareholders that the head-quarters should be removed, it could, of course, be done. But, in his opinion, the effect of such a measure would be very prejudicial—it would narrow the entire local management. At Darlington the opportunities and facilities were few as compared with London for ascertaining the position of firms, and other important matters connected with the trade. He was quite sure of this, that the gentlemen who now served the company as directors could not go down to Darlington. As to the amount of each director's holdings, he must object to the question altogether. It was not a subject to be discussed at a public meeting. If any shareholder wished to look at the register of shareholders he could do so at the office. As long as the shareholders fixed the qualification of the directors, it was clear they had no right even to ask whether they held more than that. Then in regard to the directors' fees, as he had said, they had taken only one-half of the remuneration to which they were entitled. Under the Articles they could have drawn 300*l.*, instead of which they had taken only 150*l.*; as to the division of those fees, that was a question solely for the board, and had nothing whatever to do with the shareholders.

Mr. J. H. LLOYD said he had taken a great interest in this concern, because he never undertook any part of the management of any work without feeling it his duty to give his best attention, his best knowledge, and his best energies to it, and he had done so in this particular case. Now, the prospectus certainly led those who subscribed for shares to anticipate a much better profit upon the working of the company than had been shown, and naturally there had been considerable disappointment that that anticipation had not been realised. In order to arrive at a correct opinion on the subject it was necessary to contrast the circumstances that existed when the prospectus was issued, and those that had subsequently transpired. The owners of the property before its purchase by the company had actually realised a profit of 30,000*l.*, and it had been rightly calculated that that would produce a return of about 15 per cent. upon the capital of the company. Not one single statement of the prospectus, except the amount of net profit, had not been realised; the output had even been larger than estimated; but it had so happened in the last two years the cost of production had been so much in excess of what it had been before, and the price of finished article so much less, that it was impossible there should be other than a very material deficit upon the working of the company. This was not due to any fault of the management; they could not control, the price of pig-iron, or the rate of wages. Such a state of things, however, would not continue, it was contrary to the experience of all past years, the average of which showed a good profit in this particular branch of trade. In 1874 things began to amend in that respect. Coals were reduced in price, and gradually wages grew less. They had felt the benefit of that, but the markets were also dull, there being heavy competition elsewhere, and, under all the circumstances, he ventured to think that this company had done remarkably well, and the shareholders owed a debt of gratitude to the local management for the results produced. No other works had made such returns as those of their company—indeed, the general opinion was that they had done remarkably well, and that theirs was the green spot in the desert wilderness. Things were still improving. Pig-iron was still further reduced, and they expected another fall. Coals were also materially lower in price, and they were now in a position to make a profit—all that they wanted was a better demand and a better price. He ventured to say that in next and future years none of the shareholders would have cause to regret the investment they had made in this company. The management was good, and the works were perfect. It would be impossible to find works so complete and perfect in their way as the Skerne Ironworks. Their capital was absolutely intact, and they added to their works to the extent of some 15,000*l.* If they were to sell their property to-morrow they would get their money back again. All they had lost was two years' dividends. He strongly supported the advisability of maintaining the London office, and observed that both himself and colleagues were substantially interested in the success of the concern. Although they had turned over more than 200,000*l.* last year, their bad debts did not amount to 400*l.* or 500*l.* It was most essential that the company should have a reserve fund, and he was of opinion that it could not be better invested than in the business of the company. He was quite sure if the shareholders gave the board their confidence, and submitted to the inevitable circumstances which had occurred in this company, they would not regret it. He recommended them strongly to retain their interest in the concern, for it was his confident opinion that it would eventually become a very prosperous company. (Hear, hear.)

Mr. MORRIS could not help rising to express his entire satisfaction with the explanation offered by the Chairman and Mr. Lloyd. Under the circumstances he thought the shareholders had good grounds for congratulating themselves on the results of the past year.

The resolution for the adoption of the report and accounts was put and carried unanimously.

On the motion of General WOODHOUSE, seconded by Mr. ROBERT STOPFORD, the auditors were re-appointed.

Mr. GEARD moved a vote of thanks to the Chairman and directors, which, on being seconded, was put and carried.

The Chairman having acknowledged the compliment, the proceedings terminated.

ALMADA AND TIRITO SILVER MINING COMPANY.

The half-yearly meeting of shareholders was held at the offices, Finsbury-circus, on Thursday,
Mr. PHILIP F. NEEDHAM in the chair.

Mr. H. G. DENNISS (the secretary) read the notice convening the meeting.

The report of the directors stated that the net profits for the half-year amount to 9445*l.*, and the total to the credit of revenue account, after deducting the dividend paid in March last, but including the above profit, is 20,653*l.*, which exists in stores, ores in course of reduction in Mexico, and those prepared for shipment and *in transitu*. The result is satisfactory, and contrasts favourably with that shown by the accounts for the corresponding period in 1873, when the six months' profit amounted to 4806*l.* During a portion of the six months ending Dec. 31 the Mina Grande ores were being raised and prepared for market, and there was a better water supply for the latter part of 1874 than in the previous year, hence the improved result. The prospects for the current six months are satisfactory, as the estimated profits for January, February, March, and April are much larger than at any former period. With regard to the delivery of ores in England, the Pacha has lately arrived at Swansea with 60 tons of concentrated ore. The bill of lading of 300 tons by the Palmerston has been received, and that vessel will probably arrive in Hamburg or Bremen about October next: 50 tons of ore have been shipped for England by the Ellida. The Guaymas and Crystal are also secured to bring over about 540 tons which are ready for shipment, the Guaymas being already reported as at Agiabampo ready to load on April 19.

The directors have given orders that the system of lixiviation referred to in the last report shall be tried on a small scale at the company's works, and they anticipate good results from the experimental working. If successful, lixiviation will form a valuable auxiliary to the working of the mines, enabling the manager to convert the ores into silver bars, and thus avoiding the delay and expense of transporting such ores to England as may be so treated. A survey has been ordered of the ground between the Santa Rosa Valley and the mines, with a view of ascertaining the cost incident to obtaining a good supply of water during the dry seasons from that locality. Both Mr. Clemes and Mr. Breach recommend the Santa Rosa Valley, in preference to any other spot they have seen, for obtaining an extra supply of water, and as being best adapted for the purpose of erecting the necessary machinery.

The CHAIRMAN proposed the adoption of the directors' and manager's report, and the accounts for the half-year ending Dec. 31 last, and said he would offer a few remarks upon the affairs of the company, and the general prospects of the mine. He thought they must now consider those prospects as exceedingly favourable. The result of the first four months of the present year, as compared with the four months ending April 30, 1874, was as follows:—The returns for the first four months of last year were 2930*l.* 13s. 6d., and for the first four months of the present year 9182*l.* 12s. 7d., which showed that the company's position was very much improved, which, no doubt, would be satisfactory to the shareholders. As regarded the Mina Grande, in driving the tunnel under this mine towards the Dios Padre, a bunch of ore was found some 12 ft. wide, which led the directors to look for other bunches in that direction. This was very important, and showed the great advisability of having obtained the Dios Padre Mine. The ores in transit from the mine at the present time, and for which the company had bills of lading, were of the estimated value of 12,500*l.*, more or less, and there was still a considerable quantity of ore at the port of Agiabampo awaiting shipment. The vessel Crystal was due at that port, and ought to be loading a further quantity of 300 or 350 tons, and another vessel, the Ferdinand Brumm, had been offered to Mr. Breach to bring home 300 tons, and there was little doubt that Mr. Breach would accept that offer. Those ores would probably be arriving here up to October, and would come by way of Cape Horn. As regarded the water supply, this was the season in which it began to fall off, and although it could not be said that the mine had been stopped, or had suffered from actual want of water, still there was a certain deficiency at this season which the directors always calculated upon. Mr. Clemes and Mr. Breach had thoroughly surveyed the valley of Santa Rosa, with the object of getting water from that locality, and the directors expected by the next mail to receive orders for sending out certain necessary materials. This additional water supply was not only for the purpose of assisting the present supply during the dry season, but also to be used in the lixiviation process which was going to be tried at the mine. He was happy to say that some experiments which had been made for treating the slimes had proved successful. Two machines had been ordered, and would be ready to go out by the first steamer. As regarded silver, the shareholders were aware that the price had fallen during the last 12 or 14 months about 6 per cent., but there was a limit to the fall of silver, which could not go below the price at which the Mint purchased, so that there could only be a further fall of about 2 per cent., when the lowest point which was possible would be reached in the value of silver. On the other hand, if silver had fallen in value the price of quicksilver was less by half what it was. The last purchase was effected at San Francisco at 65 c. per lb., whilst as much as $1'40 had been paid. This, of course, was a very considerable saving in the expenditure for the treatment of the docile ores, and would lessen the cost. He was in hopes that Mr. Clemes would have been able to attend this meeting, but he had been delayed on his journey, and probably would not be here for a couple of months; on the arrival of Mr. Clemes the directors would have the great advantage of hearing from that gentleman full particulars of the mine, and taking his advice upon matters of interest and importance there. The shareholders would be asked to authorise the directors to declare a dividend when the ores now on their way to this country were realised; as regarded the actual time of arrival and realisation, it was uncertain; but, as he had said, the bills of lading were in the office for 12,500*l.*, and the amount of cash now at the bankers was 3100*l.* 19s. 5d. It was with regret that he had to inform the shareholders that Capt. Henwood, whom they sent out as an underground captain, had unfortunately met his death from a fall of rock in the mine, which the directors greatly regretted, as he was a highly respectable and useful man. His place had been taken by Mr. Clemo, who had been five years in the company's service, and who would be able efficiently to discharge the duties. He proposed the adoption of the report and accounts.

Mr. F. SAUNDERS seconded the resolution, which after a short and unimportant discussion, was put to the meeting and carried.

On the motion of Mr. W. MARTINEAU, seconded by Mr. A. P. FLETCHER, the retiring directors, Mr. P. F. Needham and Mr. J. P. G. Smith, were re-elected.

The auditors, Messrs. J. Waddell and Co., were re-appointed.

On the motion of the CHAIRMAN, seconded by Mr. THOS. B. POWER, a resolution was passed authorising the directors to pay a dividend when the ores, now *en route*, were realised.

A vote of thanks to the Chairman and directors closed the proceedings.

WHEAL UNY MINING COMPANY.

A general meeting of shareholders was held at the offices, Austinfriars, on Thursday,—Mr. ROBERT M'CALLAN in the chair.

Mr. HICKEY (the secretary) read the notice convening the meeting, and the minutes of the last were confirmed.

The accounts, made up to the end of April, showed a debit balance of 1206*l.* The loss on the three months embraced in the accounts amounted to 431*l.*

The report of the agents was read, as follows:—

June 16.—The lode in the 40 end, west of incline shaft, is worth 7*l.* per fathom. Two stopes in the back of this level are worth 6*l.* and 10*l.* per fm. respectively. We have put up a trial rise west of this shaft, and to the west of the old run at the 120, but finding the lode poor we have suspended it. The men are now employed clearing the 60, west of incline shaft, where we may reasonably expect to discover profitable tin ground, as the 40 west is opening out productive. The 100 end, east of King's, is worth 10*l.* per fathom. A stope in the back of this level is worth 10*l.* per fathom. The 110 end east is worth 15*l.* per fathom. Two stopes in the back of this level are worth 8*l.* and 10*l.* per fm. respectively. The 120 east is worth 10*l.* per fathom. Four stopes in the back of this level are worth 40*l.* per fathom in the aggregate. The 130 end east is worth 12*l.* per fathom. Two stopes in the back of this level are worth 12*l.* and 9*l.* per fm. respectively. The 40 end east is improving, now worth 10*l.* per fathom. Two stopes at the back of this level are together worth 25*l.* per fathom. The 150 end, east of Goodinge's, has been unproductive for a very long distance, but is now yielding stones of tin, and looks likely to improve. The 150, west of incline shaft, appears to be entering the run of tin ground passed over in the bottom of the 140 west. The rise in the back of the 150, towards Hind's engine-shaft, is being forced on; we have now some 7 fms. to hole to the 130, there is a communication made at this shaft between the 150 and 160 fm. levels, so that as soon as the ground referred to is holed at the 130 we shall have a direct communication at this shaft to the bottom of the mine. We have a set of men employed at the 80 at Hind's for new balance-bob. The 140 end, west of incline, yields low-quality tinstone. A stope in the back of this level is worth 10*l.* per fathom. The 160, west of sump, is in a poor bar of ground. A stope in the back of this level is worth 7*l.* per fathom. The 160 end, east of sump, is worth 10*l.* per fathom. Two stopes in the back of this level are worth 8*l.* and 10*l.* per fm. respectively. We have fixed new 16-in. pitwork at Hind's shaft from the 130 to the 80, with main-rods, footway, casing, and dividing complete, and are now awaiting the necessary castings from foundry for condensing work for Hind's 70-in. engine; when this is fixed we intend to set the engine to work, so as to relieve the present pumping-engine on the old shaft. We have recently been obliged to put in new condensing work, steam and eduction pipes, with new piston-rod at the winding-engine; we have been necessitated to make these extensive repairs, as the old was completely worn out. The underground prospects are looking well, and at no period in the history of the mine has there been so much tin sold in the time as during the past twelve months; at the same time, we are sorry to remark that for many years past the tin has not been so uniformly low as it has been since your last general meeting to the present date. Although the tin market has been so depressed, yet we have kept on our full complement of tutwork drivages, and have also put down new pitwork and made extensive repairs to the machinery. We have done this hoping the price of tin will soon be higher, when we hope to reap the full benefit of anticipated advance.—WM. RICH, M. ROGERS, W. RICH, jun.

The CHAIRMAN said that while it was satisfactory to find that during the three months embraced in the accounts now submitted, the returns of tin had been 82 tons—which, perhaps, was the largest return the mine had ever before made in a similar period—they had still to regret the price realised was unsatisfactory. The mine itself was everything that could be desired, but the merchantable value of their produce was, at least for the time, against them. A great deal of extra and dead work was being done, such as sinking the shaft, and providing it with the necessary pitwork, the benefit of which would be felt hereafter. The accounts showed that there had been a loss of 431*l.* during the three months, which added to the adverse balance brought forward from the last audit, made the debit the sum of 1206*l.*

Mr. HICKEY said a great deal of work was being done, and the mine being put into good order. The loss during the past quarter had arisen from the extra cost in sinking the shaft and providing pitwork; there were only 7 fms. to reach the bottom of the mine, when they would be in a position to put the new engine to work, which would help them greatly. Hitherto there had been repeated breakages in consequence of the bad condition of the old shaft; those hindrances would be prevented by the new shaft. When this shaft was completed a reduced cost might be looked for.

Mr. BECKETT proposed that the accounts be passed and allowed, and with the report entered on the minutes.—Mr. COOPER seconded the proposition, which was put and carried. A call of 4*s.* per share was made. The committee of management were re-elected.

A vote of thanks to the Chairman closed the proceedings.

SOUTH CARADON MINING COMPANY.

At a general meeting of shareholders, held at the mine, on Tuesday, pursuant to notice (Mr. JAMES G. DYMOND in the chair), the accounts for the first, second, and third months of 1875 showed a profit of 1381*l.* 9s., and a dividend of 1*l.* per share was declared, leaving a balance of 2053*l.* 2s. 4d. to be carried to the credit of next account. The payments included—To overseers of St. Cleer parish, for poors' rate and law costs in contesting Mines Rating question, 413*l.* 8s. 7d.; to Wheal Mary Ann adventurers, for 70-in. cylinder engine, 1015*l.*; and to pitwork, rods, and building engine-house, &c., at Rule's south shaft (on account), 750*l.* The following report was read:—

June 15.—I am pleased in again being able to inform you that our mine, although without any material alteration since the last meeting, still continues good, and presents features of a cheering and permanent nature. We have, in accordance with the resolution passed at the last meeting, purchased a good 70-in. cylinder pumping engine, and most of the pitwork that will be required, which has been taken out and brought on the mine. The masons are engaged building the engine-house with all possible speed, and shaftmen in putting down the pitwork, which will be completed against the engine is ready to work; as soon as the house is erected we shall at once commence to put in the engine, and as it is in good repair we hope without delay to have it in operation. As regards the West Caradon Mine, we have not yet commenced here, as the leases are being prepared by the solicitors, and which we expect to obtain shortly, when our attention will be given to the working of this portion of the sett. It will be seen that a sum of 413*l.* is charged in the accounts for poors' rates, which we think right to explain have been accumulating for the last two years, consequent upon the question being contested.—JOHN HOLMAN.

CAPE COPPER.—At a meeting of the directors of this company, on Wednesday, a dividend of 20*s.* per share, free of income tax, was declared.

ROSEWALL HILL AND RANSOM UNITED.—At the meeting, on Wednesday, the accounts for four months showed a loss of 150*l.* 8s. 1d., including extra materials and labour for working the North mine, and adding the balance from the former meeting left a total debit of 205*l.* 11s. 6d. A call of 7*s.* per share, the amount of the debt, was agreed to, and as the prospects of the mines were considered to be improved the forfeited shares were allowed to stand over for the next meeting to determine on. Capt. Josiah Thomas, of Dolcoath, made a special report on the mines, which will be printed and circulated with the statement of accounts, &c.

DUCHY GREAT CONSOLS.—An extraordinary general meeting was held on Monday, Lord Bingham in the chair. The Chairman said the only business to be transacted was to propose the special resolution, in accordance with the recommendation of the shareholders passed at the last meeting—"That notwithstanding and without prejudice to the salaried office of manager, held by him under the company, Capt. James Richards shall be eligible for election as a director of the company, and if and when duly elected he shall not be subject to any disqualification by reason of his holding the said office." He proposed that resolution Mr. Cochrane seconded the proposition, which was put and carried.

KAPUNDA MINING COMPANY.

The annual meeting of shareholders is to be held on Monday. The report of the directors state that the working statement submitted by the lessees shows a total out-turn equivalent to 281 tons of pure copper, all sold in the colony at an average rate of about 64*l.* per ton, whilst the average tonnage charge has risen through continued unproductiveness and the heavy cost of exploration to nearly 70*l.* Under these adverse circumstances the lessees' account is closed with a loss of no less than 2510*l.*, the result not so much of unfavourable markets, or local hindrances, as of the gradual but too apparent exhaustion of the mine. The board is not yet informed of the lessees' views under so heavy a disappointment, as they are not pressed under the terms of the lease to any immediate decision; the agreement is terminable at any time on twelve months notice, and it will doubtless be under their serious consideration whether the ordinary vicissitudes of mining operations infer any fair chance of recovery from the generally bad results of the adventure in which so much capital has been embarked.

PENNERLEY MINING COMPANY.

A general meeting is to be held on Wednesday. The report to be submitted states that the directors have pleasure in congratulating the shareholders upon the improved position of the company. During the year the working of the mine has realised a profit of 2648*l.* Deducting from this the balance against the company at the last meeting, there remains a sum of 1458*l.* to the credit of profit and loss account. The report of the agents states that the returns are 80 tons lead monthly, and during the year there have been sold 960 tons; notwithstanding the very severe winter they have not omitted one sampling. The general prospects of the mine are quite equal to last annual report, and if the several trial points now in progress result successfully, they will not only be better able to keep up the returns, but eventually increase the quantity.

SWEETLAND CREEK GOLD MINES.

A general meeting of shareholders will be held on Thursday. The report to be submitted states that the period under review extends from April 22, 1874, to Feb. 20, 1875, the date of the last clean-up—a clean-up which was made after a very intermittent run, commencing on Oct. 20. The accounts show that a gross produce of 5522 ozs. of gold, realising 21,806*l.*, has been obtained, at a cost of 13,008*l.*, leaving a profit of 8797*l.* Three dividends, amounting in the aggregate to 6000*l.*, have been paid during the past year. The balance at the credit of profit and loss account is 2871*l.* As a portion of this balance will probably have been expended during the interval which has occurred between the last clean-up and the day (May 28) on which washing was resumed, the directors do not consider it advisable to declare any dividend. They propose, however, as usual, to carry 5 per cent. on the dividends paid during the past year to the reserve fund, and to write off the tunnel cost incurred during the year. This will absorb 1346*l.*, leaving 1524*l.* to be carried forward. Reviewing all the circumstances, the directors trust that a renewal of the success which has previously attended this company may be looked for at no distant date.

'For remainder of Meetings see to-day's Journal.]

LARGE BOILER.—No small stir and excitement was witnessed on Monday last, in the north part of the town, by the delivery of a large steam-boiler from the railway station to the works of Mr. John Marshall, flax and tow spinner, The dimensions of the boiler are 24 ft. long by 7 ft. diameter, with two internal furnaces and flues, and with all the latest improvements in Cornish boilers. The boiler is from the firm of Messrs. Wm. Wilson and Co., Lilybank Boiler Works, Glasgow, who are so well known here from the many fine specimens of their boilers at work in almost every factory—the whole of which, we believe, have given the greatest satisfaction. We hear of more boilers, of larger dimensions, that will shortly be delivered at Messrs. Jas. Mathewson and Sons, Bothwell Works, who are extending their premises. We are proud to note this as a sign of the prosperity of our manufactures—*Dunfermline Press.*

IMPROVED PUMPING ENGINE.—By the invention of Mr. CHARLES H. HUDSON, of Chicago, the valve is composed of three discs of like diameter, keyed on a stem. The steam which has acted on the piston, and filled the cylinder space, is allowed to act on the valve and move it into the alternate position necessary to cut off steam from the right hand end of the cylinder, and admit it, by the corresponding ports, to the left hand end of the said cylinder, to move the piston in the reverse direction. Simultaneous with the above described action of the steam on the valve, it exhausts into the outer air. The regular exhaust from the cylinder into the valve chamber is also through the ports by which the steam entered the cylinder at the previous stroke of the piston. The openings between the passage and the valve chamber are closed alternately by the end discs forming part of the valve, and the thickness of the discs exceeding the diameter of the openings, and the projecting ends of the valve stem governing the position of the valve, so that one of the discs always comes directly opposite, and thus covers the nearest opening each time the valve is moved and comes to rest. By a suitable arrangement

of water valves, the supplementary chamber, requisite in pumps whose valves close by gravity, is dispensed with, and space and material are economised.

ST. JOHN DEL REY MINING COMPANY.

The array of facts submitted in the exhaustive reports to be presented to the shareholders on Wednesday are no less satisfactory as setting forth the present favourable position of this important enterprise than encouraging as indicating a progressively successful future. Throughout the year the work of opening out the mine has been earnestly and uninterruptedly prosecuted, and with marked success. As the sump has been sunk, and the working space otherwise enlarged, greater facilities have been afforded, by the formation of a series of deep stopes, for more rapid and economic quarrying, and by this means the monthly haulage of mineral has been increased from 3219 wagons in April, 1874, to 5414 in March, 1875. The produce of gold from April 9, 1874, to April, 1875, amounted to 361,400 oits. (41,663 ozs.) The monthly increase in the produce has been in a still larger ratio than the increase in the haulage of mineral, the produce for April, 1874, being 21,028 oits., as compared with 31,405 in oits. in March, 1875, whilst the yield of mineral has much improved since the commencement of the year.

The net profit on the working of the mines for the year has been 83,241*l.*; the interest that has accrued on funds in hand, and the amount received for transfer and other fees, have been 730*l.*; the amount of net profit brought forward last year 5565*l.*, making a total of 89,538*l.*, out of which a dividend of 10 per cent. was paid at Christmas, and 10 per cent. added to the reserve fund—being together 27,830*l.* The general expenses during the year amount to 2348*l.*, leaving an available profit of 59,359*l.* Out of this the directors have the satisfaction of recommending an increased dividend of 20 per cent., free of income tax, being at the rate of 40 per cent. per annum, which with 10 per cent. thereon—which is carried, as usual, to the reserve fund—will amount to 55,660*l.*, and leave to be carried to next account 3699*l.* This result is the more satisfactory as the capital on which the rate of the dividend is calculated is greater than it was before the fire. The quantity of mineral raised during the year was 40,266 tons, and the quantity stamped 40,647 tons; 46,608 cubic feet of sand were amalgamated, being 1·14 cubic feet of concentrated sand amalgamated for each ton of ore stamped. The average standard or yield of the ore after treatment by the stamps has been 8688 oits. (1001 ozs.) per ton. The yield has considerably improved as the lode has been more opened out, the average yield for the first six months having been 7·838 oits. per ton, against 9·418 oits. for the last six months of the year. This improvement has still continued up to the date of the latest advices. The mean loss of gold per ton in treatment has been the smallest ever sustained by the company.

The comparison between the produce, cost, and profit of 1866 and 1867 shows a remarkable difference in favour of the results obtained during the past year; the produce during 1866 was 204,717*l.*, against a cost of 124,278*l.*, leaving the profit 80,429*l.*; in 1867, the produce was 243,923*l.*, against a cost of 134,156*l.*, leaving a profit of 109,407*l.*; while during the past year the produce has been 144,076*l.*, against a cost of 60,834*l.*, leaving a profit of 83,247*l.*

In making a careful review of the operations of the company during the past year, and referring to the plans in existence and in contemplation for the working of the mine, it would not be justifiable to state that all has yet been done for carrying on efficiently this very important mining establishment, but good duty has been performed in opening and so far developing the mineral lode as to almost achieve within the 12 months that which was indicated by the manager might be accomplished within 18 months. The results obtained are more than the proprietors were led to expect, whether as regards the cost of working, the gold to be extracted, or the profits to be realised.

The manager urges the desirability of continuing to introduce more machinery, for the saving of manual labour both in the mine and at the surface, and to persevere assiduously and earnestly in the proper extension and opening out of the fine mineral lode now partially available. Should these matters be fairly and efficiently attended to the results will undoubtedly be highly advantageous to the proprietors.

FOREIGN MINING AND METALLURGY.

Business in copper has continued quiet at Paris; the market has remained, in fact, in a languishing condition. Chilian in bars, with delivery at Havre, has brought 87*l.*; ditto, ordinary descriptions, 86*l.* 10*s.*; ditto, in ingots, 91*l.* 8*s.*; English tough cake, 90*l.*; and pure Corocoro minerals, 86*l.* per ton. At Marseilles copper has generally ruled firm. The German copper markets have been feeble, and prices have been to some extent nominal. The improvement in the English tin markets has restored some firmness to the Dutch Exchanges, upon which sellers of tin have exhibited extreme reserve. On the other hand, purchasers have abstained from buying as much as possible, as they regard the present upward movement in prices as rather speculative than permanent. Billiton has brought 49 fl., and disposeable Banca 50½ fl. At Paris tin has experienced a slight fall; Banca, delivered at Havre or Paris, has brought 92*l.*; ditto Straits, 87*l.*; ditto English, delivered at Havre or Rouen, 90*l.* per ton. There is little to report with respect to the German tin markets. There has been some little feebleness in lead at Paris; French lead, delivered at Paris, has brought 22*l.* 8*s.*; and Spanish, delivered at Havre, 22*l.* per ton. Lead has also fallen at Marseilles. The German lead markets have been somewhat colourless. Paris quotations have exhibited little change; Silesian zinc, delivered at Havre, has made 25*l.* 4*s.*; and other good marks 24*l.* 16*s.* per ton. The rolled zinc of the Vieille-Montagne Company has experienced a slight rise at Marseilles; at the last dates it was quoted at 32*l.* per ton. The German zinc markets have presented little interest.

There are few interesting items of intelligence to report with reference to the Belgian coal trade. There is a scarcity of business, and the dead season which is now prevailing will probably continue until the winter. Prices appear likely, however, to now remain stationary for a time. A comparison of the rates now current for coal with those prevailing in 1873 and 1874 shows that Belgian coal owners have been obliged to very materially modify their late exaggerated pretensions. A rather important contract for coal will be let on July 13 by the Administration of the Civil Hospitals of Brussels.

The fall which has been for some time taking place in coal in France appears now likely to be checked, as it has almost been carried to its extreme limits. In the North of France, and especially in the Pas-de-Calais, some of the more powerful coal mining companies are increasing their extraction so as to spread their general expenses over a larger number of tons of coal available for consumption. The Rety, Ferques, and Hardingen Collieries, for instance, which have recently carried their capital to 80,000*l.*, increased their production last year to 52,771 tons; this year, according to the least sanguine calculations made on the subject, the corresponding production will be increased to 70,000 tons. All collieries cannot, however, follow this enterprising example, as if they did they would soon find themselves burdened with considerable stocks. The advantageous position of certain collieries in the immediate neighbourhood of canals, the exceptional quality of their products, and their good management, enable them to defy all competition. The coal trade has remained very dull and quiet at Paris. In the basin of the Loire the coal trade has also been quiet, and prices have not varied. In the Centre quotations have been relatively firm. A general mining congress has recently been held at St. Etienne, under the presidency of M. Gruner, Inspector-General of Mines. The sittings of the congress extended over five days, and the members visited several of the collieries and ironworks of the basin.

French metallurgical industry must still be said to linger on in an unsatisfactory condition. Some small—almost retail—orders continue to be given out, and enable the works to resist an otherwise fatal reduction of tariffs. The Paris iron market has been quiet, upon the whole, orders are scarce, and are accordingly keenly disputed. In the St. Dizier district there has been a rather sustained current of orders for machine iron, axles, &c.; quotations have exhibited little fluctuation. There has been a small current of orders in the Nord, but the forges are only working on from day to day. No. 2 merchants' bars have made 8*l.* 7*s.* 3*d.* per ton. In the Meurthe-et-Moselle refining pig has made 2*l.* 16*s.* per ton; in the Nancy group the corresponding quotation is 2*l.* 18*s.* per ton. No. 3 second fusion pig has brought an average of 3*l.* 15*s.* 2*d.* per ton. No. 1 is maintained at 4*l.* 8*s.* per ton. First-class merchants' coke-made iron has brought 8*l.* 8*s.* per ton.

No improvement can yet be reported in the Belgian iron trade, which exhibits an apparently chronic stagnation. The only transactions of any importance which are noted are an order for 600 tons of rails for Antwerp tramways, which has been secured by M. Pierard, and an adjudication for 500 trucks for the Belgian State railways. The latter contract was shared between the Metallurgical and Colliery Company and MM. Nicaise and Delcuve; there were eleven tenders submitted, the range in prices being 20 per cent. M. Verhaeren, of the house of Verhaeren and De Jager, has left for Brazil, and certain other South American countries, in order to open out fresh markets for Belgian iron. The Sclessin Company has been officially authorised to reconstruct four of its blast-furnaces with the requisite accessories. Prices of pig and iron have remained rather feeble in Belgium; at the same time they have not exhibited any material variation. The Thy-le-Château Blast-Furnaces and Forges Company will also pay a dividend for 1874 at the rate of 40 per cent. per annum. The Sambre and Meuse Mines and Ironworks Company also pay a dividend for 1874 at the rate of 12*s.* per share.

FOREIGN MINES.

ST. JOHN DEL REY MINING COMPANY (Limited).—Advices received June 3, 1875, per Tiber (s.), dated Morro Velho, April 29:—

GOLD EXTRACTED TO DATE.—The produce extracted for the second division of the month of April, being a period of 11 days, amounts to 17,419·3 oits. It has been derived as follows:—

	Oits.		Tons.	Oits per ton.
From mineral stamped	16,287·0	from	1494	= 10·901
Re-treatment	1,132·5	,,	—	= ·758
Total	17,419·5	,,	1494	= 11·659

Oits. Ozs. troy. Oits. Ozs. troy per ton.
Or 17,419·5 = 2008·1848 = 11·659 or 1·3442

The foregoing is a large produce, the largest yet extracted both per ton and per diem since the re-opening of the mine.

Advices received June 16, ex Douro, dated Morro Velho, May 17:—

GOLD PRODUCE FOR THE THIRD DIVISION OF APRIL.—The gold extracted during the third division of April, a period of 10 days, is as follows:—

	Oits.		Tons.	Oits. per ton.
General mineral	15,871·3	from	1406	= 11·288
Re-treatment	1,208·6	,,	—	= ·859
Total	17,079·9	,,	1406	= 12·147

Equal to 1969·0344 ozs. troy = 1·4044 oz. troy per ton.

This return exceeds in the yield per diem and the standard of the mineral any of its predecessors since the recommencement of the reduction operations. It is, however, not to be expected that this high rate of gold extraction will continue, but should rather be set down as exceptional.

GOLD PRODUCE FOR APRIL.—The gold extracted during the month of April is, therefore, as follows:—

	Oits.		Tons ore.	Oits. per ton.
From general mineral	44,281·1	from	4127	= 10·729
Re-treatment	3,236·3	,,	—	= 0·784
Total	47,517·4	,,	4127	= 11·513

Equal to 5477·9832 ozs. troy = 1·3273 oz. troy per ton.

The steady increase in the months' return, as well as the improving gold contents of the mineral treated, is fully shown by the above figures.

GENERAL OPERATIONS.—These have proceeded since last advice without any remarkable incident or interruption; this remark may be similarly applied to the operations of the different departments, with the exception of the stopping of the pumping machinery on the 8th current, on account of the failure of a rabbit-ring of a working barrel, and that the reduction machinery has been suspended in its operations for the purpose of repairs.

COST AND PROFIT.

Gold produce	47,517·4 oits.	
Less loss in melting	354·2 ,,	
47,163·2 at 7s. 9d. per oit.	= £18,275	14 9¼
Cost, less sums receivable to credit of cost	6,291	12 0
Profit for the month of April	£11,984	2 9¼

The augmentation of produce more than compensates for an increased expenditure both in labour and materials, which has been necessary in carrying on the company's operations, and gives the very satisfactory results of the largest profit on any months' operations since the re opening of the mines.

GOLD EXTRACTED TO DATE.—During the first division of May, a period of 11 days, the undermentioned gold produce has been obtained in the reduction department:—

	Oits.		Tons.	Oits. per ton.
From general mineral	15,373·0	from	1366	= 11·254
Re-treatment	1394·6	,,		1·020
Total	16,767·6	,,	1366	= 12·274

Equal to 1933·0314 oits. = 1·4151 ozs. troy per ton.

This is very good produce, though it does not equal that of the preceding division. The mineral treated has retained its high standard, the reduced returns per diem being attributable to the lesser quantity passed through the reduction process in consequence of the repairs of stamps.

WATER SUPPLY.—The quantity of water coming on the establishment is lessening as the dry season advances, the indication being shown in our water power in some places being now limited.

The following telegrams have been received:—

On May 24, profit for the month of April 11,900*l.* All going on well.

On June 5, produce 10 days (second division of May) 17,250 oits. General work in mine and on surface going on well, and satisfactory duty being accomplished.

On June 14, produce for month (May) 49,255 oits. All going on well.

DON PEDRO NORTH DEL REY.—Report for April: Produce and Cost: Produce, 1725 oz. troy, 6359*l.* 14*s.*; cost, 3042*l.* 0*s.* 6*d.*: profit, 3317*l.* 13*s.* 6*d.* [The April cost includes an exceptional item of over 120*l.* for travelling expenses of the six English miners recently sent out, whilst the outlay during the month for timber and materials appears higher than usual. The charges, export duty, &c., on gold are, in consequence of the higher produce, 86*l.* in excess of March.] —First Division of May: Produce weighed, 2690 oits.; remittance (one month), 13,919 oitavas bar gold.—Mine Captains' letter, dated May 17: "Operations throughout have progressed very satisfactorily considering our force." Telegram from Rio, June 7, referring to a later date than the above advices, was received on the 8th inst., and sent to the newspapers: Produce cleaned up (on account of May), 6100 oits; estimated total for the month (May), 8200 oits."

SANTA BARBARA (Gold).—The directors have received advices from their manager, Mr. Hilcke, dated Pari, May 12, with the results of the working of the mine for the month of April. During April 812 tons of mineral were sent to the stamps, of which 807 tons were stamped, yielding 3·197 oits. per ton, or a total of 2580 oits. of gold, which, valued at 8*s.* 6*d.* per oit., amounted to 1096*l.* 10*s.* as the month's produce. Working cost was 867*l.* 13*s.* 3*d.*, thus leaving a profit of 228*l.* 16*s.* 9*d.* on the month's working. There was in addition a sum of 156*l.* 9*s.* 3*d.* expended on capital account during the month of April for new stamps and watercourse to stamps. In the mine the lode presented much the same appearance in the stopes as when last adviced. The somewhat lower average yield of the stone for April as compared to March, being attributable to less auriferous quality of lode in stopes of No. 1 or uppermost level, which has to be quarried in order to open out the mine to the best advantage for future working. The manager expects the yield per ton of stone will improve as more depth is attained in sinking.—New Works: Good progress had been made with No. 4 stamps during April, and the works of these stamps would be more or less completed during May, but it would be another month before the launders for carrying the water to these stamps were finished. A remittance of gold valued at 2283*l.* 10*s.* 6*d.* has been received by the company's agents in Rio Janeiro, and forwarded by them per Douro.

CEDAR CREEK.—Telegram from Col. T. B. Ludlum, dated June 16: Total product $10,000. The running expenses are $4250. Paid on account of permanent improvements $3000. Yankee claim not included.

LONDON AND CALIFORNIA.—Telegram from the company's agents in San Francisco: Amador clean-up for May amounts to $22,500; total expenses, $8500; ore crushed, 644 tons; remittance, 5000*l.*

SIERRA BUTTES.—June 12: Result of the working at the Sierra Buttes and Plumas Eureka Mines for May:—Sierra Buttes Mines: Receipts, $31,626; total California expenses, including cost of mining and milling, $21,779. Plumas Eureka Mine: Receipts, $30,616; total California expenses, including cost of mining and milling, $16,526. Concentrators all running satisfactorily.

JAVALI.—Capt. Sohns, May 6: We crushed 552 tons of quartz, yielding 368½ ozs. of gold, at an average of 9 dwts. 17 grs., valued at 738*l.* The expenditure has been 637*l.* 8*s.* 8*d.*, which includes 129*l.* 2*s.* 2*d.* on capital account, thus leaving a balance of profit on the working expenses of 179*l.* 13*s.* 6*d.*

MINERAL HILL (Silver).—Mr. Hoskins, the superintendent at the mines, writes, May 24: The week's produce from the company's mines not on lease is 20 tons, of 346 ore, and there has been worked at the company's mill during the same time 143 tons of ore, which gave an average bullion extraction of 844·85 in silver per ton from ore purchased, and Queen's Company's ore. The mines generally have fallen off during the week, and there is a good deal of limestone showing in the stopes.

INDEPENDENCE (Gold).—Mr. Kitto's report of May 16 has been supplemented by a letter dated the 23d of the same month, from which it appears the work at the mine was making very satisfactory progress. A cable received on June 17 states that the May expenses were $5000, and that the clean up, after a run of 32 days, produced $7500. Mr. Kitto has engaged a superintendent of great ability to take charge of the mine.—[Mr. Kitto's report and extracts from the letter above referred to will be found elsewhere.]

BIRDSEYE CREEK.—G. S. Powers, May 24: My last letter was dated May 17, since which there is nothing of further interest except that in running our drifts for powder-blasting we struck into other old breastings, which we did not expect. It is nothing serious, however, being only a small excavation of about 50 ft. on the front by 30 ft. deep. The gravel around this excavation and over it looks better than anything struck heretofore. The gold is fine, but well diffused throughout the bank, from the rock upwards, for 30 or 40 ft. We shall not be able to get off a blast in this portion of the bank before the 15th or 20th of next month, after which I feel confident (if this rich-looking stratum continues) that our results will be much more satisfactory. There is not much change in the water supply since my last, but as the weather continues warm and dry I shall look for a falling off very shortly. I shall not send you cablegram before July 1, as I think now from the outlook that we shall do far better for the month of June than for the present month. I shall buy water from South Yuba as long as I can get it, but I cannot at present tell how long that will be, neither can they.

CHONTALES.—W. Smeddle, May 5: In consequence of repairs to the foundation of a portion of the battery we have only reduced 1500 tons of ore. The quantity of gold obtained has been 246 ozs., and the average yield 3¼ dwts. per ton. Total expenditure for the month, 796*l.* 12*s.* We value the gold obtained at 680*l.* The above cost includes the sum of 98*l.* 17*s.* expended on construction account. —San Benito: I enclose a section showing the ground which has been excavated during the past month, also the point at which the new cross-cut intersects the lode, this level will very materially facilitate the working of the mine. I am now pushing on the level east on the course of the lode, which at the point of intersection was only 18 in. wide, and poor; it is now upwards of 6 ft. wide, and of better value; there is not the slightest doubt it will further improve as we advance eastward in the old workings. The lode in this direction is from 12 to 15 ft. wide, and very payable. The portion we are stoping is at present poor. The quantity of quartz extracted has been 452 tons, and the yield about 4 dwts. per ton.

San Sebastian: The improvement in No. 2 level, reported last month, I am sorry to say did not continue; we are still driving this level east, and I hope yet to meet with a payable and more extensive shoot. On the south lode I am putting up a chimney to surface, and will, as soon as completed, open a level to the eastward on this lode, at the same depth as No. 2, on the north lode; my chief expectations are from this part of the mine. The quantity of quartz reduced has been 350 tons, and the yield 2¾ dwts. per ton.

Santo Domingo: We are now opening up the ground eastward; the lode is at present about 5 ft. wide, and hard. There is no change in the stopes. The quantity of quartz reduced has been 336 tons, and the yield 3 dwts. per ton.

Estrella: We are stoping over the back of No. 1 level near to the surface. I wish to have this ground out before the rain sets in, which will be in about a month. We have not been able to carry on the level for the lode west of slide, the ground being very wet and difficult to drive. We are now repairing the deep level preparatory for the rains, and will drive for the lode from this level. The quantity of quartz reduced has been 262 tons, and the yield about 3¼ dwts. per ton.—San Antonio: At present there is no quartz in the end, and we are throwing the stuff over the tip. The ground appears to have been clearer worked than further back, according to the section. I expect that in about 50 ft. more of driving we shall be under where the ground has not been stoped, until which we cannot expect to get much quartz. The quantity extracted has been 100 tons, yielding 3¼ dwts. per ton. —Machinery, &c.: The foundation under the first battery has been examined, and additional timber placed under the mortar boxes, which I trust will do away with the vibration; it will be ready for work to-morrow. The frame work of the pneumatic stamps has been completed, the guides and pillow blocks for shaft have been placed in position, and two or three days more would complete the whole, so far as the stamps themselves are concerned. The water rate is a much more costly undertaking than I anticipated, having met with a hard basaltic dyke 40 ft. thick, and through which it is necessary to make a cutting 6 ft. deep—the whole requiring blasting. I have not the slightest doubt we shall be able to obtain and treat a larger quantity of ore during the ensuing rainy season than has been done before. Our costs will not be proportionately increased, and I believe the yield per ton will be better.

BATTLE MOUNTAIN.—Capt. Richards, May 27: In the 330 ft. level, north of the new shaft, the ground is somewhat harder, spots of ore, and occasional good stones of ore, and spots of native silver occur, making a most promising ledge. The stopes in bottom of 260, south of Smith's winze, are nearly exhausted, and we shall drift a midway drift north thereof for proof if ore ground makes away in that direction. The stopes south of Cook's winze in back of 260, north of new shaft, turn out some rich ores. The stopes in the bottom of the 260, south of Steven's and Tonkin's winzes, produce some good ore, but will soon be exhausted from present appearances, yet the ledge is fine looking, and as it is just underneath this, were the 330 is approaching with a fine looking ledge, I hope it may make ore in quantities. In the 260, south of the new shaft, the ledge has not yet made ore, but of large size—in fact, we have no walls yet: 300 sacks raised.

CAPE COPPER.—Ookiep, Capt. Tonkin, April 30: We have not yet intersected the bunch of copper in the 80 fm. level, but we sometimes find good stones of ore in the drivings, and the nature of the ground shows that we are getting near the productive run. I have no doubt in the course of a short time we shall be winding rich ore from the bottom of the mine. The 68 fm. level, east from No. 13 winze, has not produced much ore of late, but the end is again showing signs of improvement; this driving is opening out a wonderful length of productive ground, but, as mentioned in former reports, I cannot tell how wide the ore is at this point, as the nearest cross-cut is more than 20 fathoms behind the present end of the level. It will, perhaps, be remembered that the 68, south from No. 15 winze, was somewhat disappointing, as the driving got into poor ground sooner than we expected, but, as I anticipated, it was only an unproductive layer of ground running almost horizontal, and the rise which we are now working in the back of the level, not far behind the end, is in a splendid bunch of copper ore. I may here notice that we are working vigorously over a large area of ground in the 68, and it is very satisfactory to find that on the average the various stopes are yielding very well indeed, and when we cut into the productive ground at the bottom of the mine, and open communication with upper levels by winzes, &c., we shall be in a position to stope away the ore ground at a rapid rate. In the 68 we are extending some of the stopes into new ground, and altogether we have a large quantity of copper ore to take away in this level; but we are not at present doing much at this point in carrying on explorations, as the main body of the good ore ground is already opened out for convenient stoping, but I intend shortly to start a driving towards the western flookan course, in order to prove a promising piece of untried ground which is standing in that direction. In the 48 we are opening a good stope east from No. 14 winze, and the branch of ore that we followed in the driving is evidently opening out wider in depth. We are getting on very well with our surface operations; we have lately started the new Collom's jiggers to work, and they answer our purposes very well indeed. At the present time we are treating a very large quantity of stuff, and all the machines on the new dressing-floors are doing good service. The quantities of ore returned for the past month are as follows:—900 tons of 21 cwts. from the mine, 100 tons of 21 cwts. from the surface reserves.

SPECTAKEL.—Capts. Tonkin and Lanksbury, April 27: The stopes in the 46 fm. level, north of incline, yielded several tons of copper pyrites during the past month, but whether it will continue in depth or not we cannot tell; however, at present it is looking a little promising. We are driving and stoping in the 36, north from incline, on an irregular joint; this place yield a little ore, and we think it worth a trial. The piece of ground that we are opening out in the bottom of the 27 continues of a kindly nature, and there is a chance that it may lead to something of value east of the flookan course. Returns, 48 tons of 21 cwts.

TRIAL MINES.—Capt. Tonkin, April 15: The shaft at Karolusberg has reached the required depth for a 20 fm. level, and the shaftmen are now engaged in fixing pump-work, lengthening skip-road, &c. In the course of a very short time we shall be driving out the 20, in order to prove the ground at that depth. There is no copper ore in bottom of shaft, as the lode changed its course in the lower part of the sinking, and we shall have to drive a little south to intersect the vein. The 10, east from shaft, have not materially changed since last reported. We have almost exhausted our trials at the New Centre, near Kilduncan, consequently I intend shortly to remove the men from there. In the bottom of the shaft at Narrap we have a little copper ore, but nothing of any value. A few days ago I took a stone of ore from the deepest part of the sinking, which assayed 13·33 per cent. At the New Centre we continue to drive the level from the bottom of the shaft, but we have not yet intersected anything of value.

RETURNS FOR APRIL.—Ookiep, 955 tons of 26 per cent.: Spectakel, 45 tons of 34 per cent.—Railway: Traffic for four weeks ending April 30, 353 tons up, and 710 tons down.—Bills of Lading received: 200 tons of ore per Roman, 200 tons per European, and 340 tons per Lynwood.—Arrival at Port Nolloth: The Ocean King, to load about 560 tons of ore.—Arrival at Swansea: The Taena.—Sales: By public ticketing, 440 tons of ore, on May 18, at at average of 16*s.* 5½*d.* per unit, realising approximately 10,250*l.*—Put Forward for Sale: 240 tons on 15th inst., and 400 tons on the 29th inst.

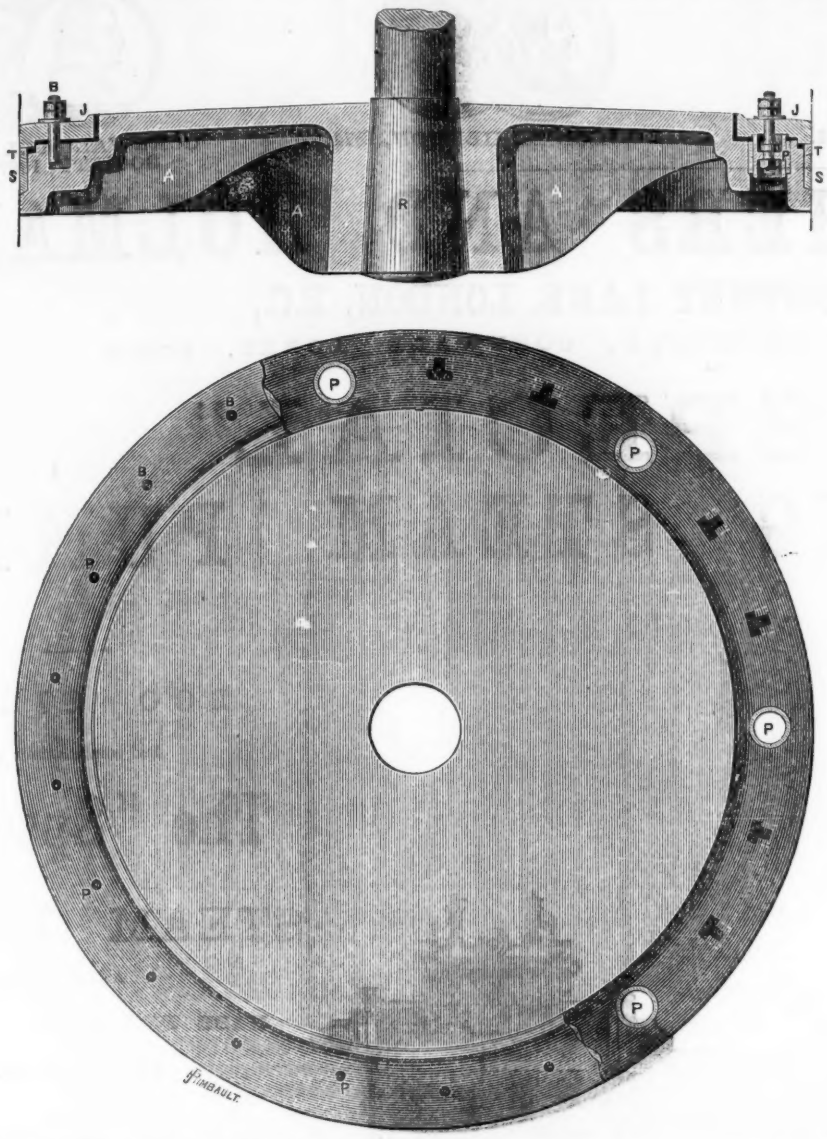
MENZENBERG.—R. K. Roskilley, June 16: Dickins's Engine-Shaft: Satisfactory progress has been made in the 45, west of cross-cut, during the week: the ground here has a very promising character, and it is still being intersected with north and south branches or feeders underlying west, composed of friable spar, mundic, and peach; the end is favourable for driving, and it is now 26 fms. 2 ft. 6 in. west of cross-cut; we are pushing on this level with all possible dispatch, in order to cut the main or St. Josephberg's lode. In the 45 fathom level, east of cross-cut, we are driving in a fine looking lode 3 ft. wide, consisting of mundic, peach, quartz, and black oxide of copper. In the south side of the level we have just met with a branch 1 ft. wide, composed of quartz, with spots of yellow copper ore intermixed; this branch, according to its present angle, will unite with the lode in about 9 ft. further driving; at that junction we expect an improvement in the lode; this level is driven 9 ft. west of cross-cut. We have no other change worthy of remark.

BENSBERG.—C. Craze, June 14: The Victoria shaft being now drained, the sumpmen will recommence sinking to-morrow. We purpose to sink about 6 ft. more for cistern plat, and then to fix the plunger-lift. When this is completed we shall then drive a level east of this shaft under the good ore ground west of new shaft. This will, I think, open out good ground for stoping. We have resumed driving the 14, west of Victoria shaft, where the lode produces fully 3 tons of ore per fathom; a stope in the back of this level will produce 2½ tons per fathom. I am pleased to say these points are looking well, and promise to turn out a good deal of ground that will pay well to stope.—New Shaft: The level west of this shaft is now drained, and the slime, &c., cleared out of it, and three men put to stope where the lode will yield 2 tons of ore per fathom; we have also four men stoping east and west of this shaft in open cast, where the lode produces good work for dressing. The stope of carbonate in west end of open-cast is looking a little better, and I think for the present month will yield fully 12 tons of good quality ore. In the dressing department we are getting on fair, and I have no doubt, when the plunger-lift is fixed in the shaft, we shall do better still, as we shall then have water enough without let or hindrance. To sink 6 ft. in the shaft and complete fixing the lift will take from three to four weeks; every effort will be made to get it down as quickly as possible. Stuff dressed for the week 40 tons, producing 9 tons ore of 44 per cent.

[For remainder of Foreign Mines, see to-day's Journal.]

Vice-Chancellor Hall has appointed Mr. J. Waddell and Mr. Hunter provisional official liquidators of the Oakwell Colliery (Limited).

PATENT PISTON FOR SINGLE-ACTING BEAM ENGINES.



PATENT PISTON FOR SINGLE-ACTING BEAM ENGINES.

The body of the piston is formed with a number of holes or passages (P), in which are fitted small pistons which work therein, and are accurately fitted with spring rings. These small pistons are connected to the junk ring (J) by means of stems and nuts. S is the packing ring, cut and tongued, whose edges are bevelled, and T is an intermediate ring, having only its lower edge bevelled. The bevelled surfaces of the rings S and T, and the lower part of the packing recess, are ground so as to fit each other accurately. Any excess of pressure on the upper side of the piston has the effect of causing the junk ring (J) to press against the intermediate ring (T), thereby forcing the packing ring (S) against the inner surface of the cylinder by compressing it between the bevelled surfaces of the body of the piston and intermediate ring (T).

In the *Mining Journal*, June 5, we illustrated Messrs. QUICK and SAMPSON'S Patent Steam Packed Piston for double-acting engines. We now place before our readers a section and plan of piston for single-acting beam-engines, the working of which for the last seven years has proved a great saving over the ordinary packed piston as now used, and so tenaciously adhered to, by mining engineers; by the use of this piston friction is reduced considerably, being only just sufficient pressure thrown against the packing rings to keep a steam-tight piston on the down-stroke, and in the up-stroke the pressure being withdrawn friction is reduced to a minimum, little or no tallow being used, only requiring to be examined twice every year, and maintaining a true and even surface on the sides of the cylinder, are matters which will arrest the attention of all those interested in the single-acting engine, and its economy in working expenses, whether shareholders or engineers, and when fully known we augur for such appliances universal adaptation. Economy being the prevailing topic discussed at all our mine meetings, we have called attention to this simple, efficient, and ingenious piston, which is used with the greatest satisfaction in those colosal Cornish pumping-engines at the Southwark and Vauxhall Waterworks, Battersea, and the Grand Junction Waterworks, Brentford, sizes ranging from 60 in. to 112 in. diameter of cylinders. To those desirous of becoming acquainted with the best practice, combined with simplicity and economy in pumping and now in use for water supply to towns and citys, a visit to the magnificent pumping station of the last-named water company will demonstrate that the Cornish single-acting beam-engine, with the patent piston, pump-valves, improved perfect steam-jackets, lagging for prevention of radiation of heat, and other improvements tending to economy not yet carried out at the mines, and all being kept in the best working condition, which leads to a very high duty being done, must be acknowledged to be for the purposes indicated above, and for draining deep metalliferous mines, among the many types of engines being employed for pumping purposes, still the best machine calculated to do the work with economy, safety, and accuracy.

IMPROVED AMALGAMATOR AND SEPARATOR.—For saving gold from auriferous and magnetic sands, and gold, silver, and amalgam from the tailings or pulp of quartz mills, Mr. JOHN RUTHERFORD, of San Francisco, proposes an amalgamator which consists of a series of steps or levels one below the other in an inclined frame, and the pulp or sand is made to pass from the upper level, on which it is fed, alternately through a series of screens, which are provided with amalgamated balls or cylinders of copper or other metal, and from these screens over amalgamated plates until the mass reaches the lower end. An alternate shaking and concussive movement is given to the frame holding these screens and plates, by which the balls or cylinders are kept in motion all the time, and being amalgamated a throrough and complete separation of the precious metals is accomplished. The inventor finds that the use of amalgamated balls in constant motion upon the surface below serves to stir up the sand and gold, and to wear "rusty gold" bright, so that it will all be amalgamated, while a certain electric action, consequent upon the use of the copper balls and iron screens, will assist in saving the gold and any amalgam or quicksilver from the pulp of mills. It is, however, in working the magnetic or black gold sands that the invention is chiefly valuable, as those sands have already been naturally subjected to the action of water to such an extent that there is no appreciable difference in the specific gravities of the different constituents, and it is almost impossible to save the gold by any means known at present. By this machine such a thorough rubbing and separation of particles takes place that all the gold is brought into contact with quicksilver under such circumstances that it will be almost certain to amalgamate.

WHITE BRASS BEARINGS.

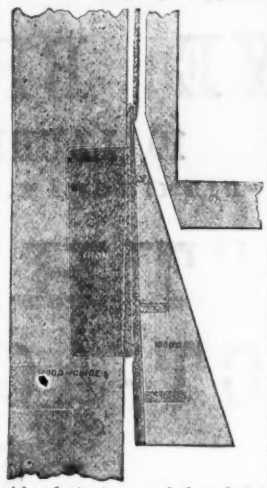
In the case of bearings for shafts and axles the value of the metal or alloy used can only be ascertained by actual practical experience, a circumstance which prevents many inventors of really useful alloys from even getting their material tested; it would seem, however, that at the present time this causes but little inconvenience, since the economy and durability of white brass really leaves nothing to be desired. Although somewhat similar in colour, white brass, or as it is more commonly called Parsons' white brass, differs essentially from what is generally called white metals, and should not be classed with them, being harder, stronger, and sonorous; it is, in fact, as its name implies, a species of brass, and behaves like it under the tool when bored or turned, it does not clog the file, and is susceptible of a very high polish; at the same time, it fuses at a lower temperature than ordinary brass, and can be melted in an iron pot or ladle over an ordinary fire, which renders it exceedingly useful for fitting up engines and machines where first cost is an object, as it can be run into the plummer-blocks or framing to form the bearings, bushes, sockets, &c., without the expense of fitting or boring them, or it can be cast in metal moulds, or, like ordinary brass or gun metal, in sand or loam. It has now been in use for many years for railway carriage and engine bearings, shafting, rolling-mills, fans, and the wearing parts of many other kind of engines and machines.

Except when used as carriage-axle bearings it is difficult to obtain a reliable comparative test of the durability of bearing metal, owing to the impracticability of having the bearings in competition with each other, working simultaneously, and under precisely corresponding conditions; fortunately, however, the wear of a carriage axle bearing so accurately represents the varying speeds, pressure, &c., met with in one or other class of industrial machinery that an alloy which can successfully pass through the ordeal of continued use under a railway carriage is accepted with every confidence as applicable wherever bearings are employed. The manner in which Parsons' White Brass passed through this ordeal is most satisfactory. Two white brass bearings were put under one end of a Great Northern brake van, and at the same time two ordinary brass bearings were put under the other end, and the van was run 19,200 miles, or twenty-four trips to Edinburgh and back, and it was found that whilst the white brass had diminished in weight but 2 ozs., the ordinary brass had lost no less than 2 lbs. 4 ozs. Under two third-class passenger carriages (same railway and conditions) the white brass lost 2½ ozs., against 1 lb. 6 ozs. and 1 lb. 12 ozs. respectively of ordinary brass during 20,000 miles running; the locomotive engineer remarking that the bearings ran perfectly cool, and were lubricated with oil. The brake-van bearing, after it had run the 19,200 miles and weighed, was replaced, and the following week the van was again put in a train, this time running 24,956 miles, or 31 trips to Edinburgh and back. As the van then required varnishing it was in the shop at Doncaster for a month, when it was brought into use again, and up to the Saturday preceding the date of the report it had done another 20,556 miles, making 64,712 miles in all, the locomotive engineer then writing—"These bearings are yet in very good order, and but little worn."

With such results as these it is not surprising that the manufacturers assert that the white brass has been found, by carefully conducted experiments, to greatly surpass in durability all other kinds of anti-friction metal against which it has been tested, to reduce friction to a minimum, and effectually prevent heating of the journals. It is equally effective with quick as with slow speeds, and will work satisfactorily under the heaviest weights. Some recent applications also show that it can be used with success to replace worn-out bearings even when the journals have been greatly worn and scored from long continued use, without the necessity of re-turning them. The price of the white brass being less than that of gun-metal or ordinary brass, and its durability very considerably greater, a double saving is effected by its use—first, in prime cost, and secondly, in renewals and repairs, to which, in the case of railway carriages, heavy shafts, &c., which have to be lifted to replace the bearings, should be added the saving in the cost of labour, and the loss arising from stoppages. The testimonials which the White Brass Company have received show that the material has been extensively used in almost every branch of industry, and has invariably given the utmost satisfaction.

PATENT SAFETY APPARATUS FOR LIFTS AND HOISTS.

Considerable attention is at present directed to Mr. H. A. DAVIS'S "Patent Safety Apparatus for Lifts and Hoists," which has many great recommendations: it is very simple, perfectly effective, inexpensive, can readily be applied to existing lifts, and last, though not least, it is very much needed. It is believed that it has only to become known to be universally adopted. The many fearful accidents and deaths that are continually occurring through the want of such an apparatus as is about to be described has hitherto much retarded the use of lifts. It is believed that with Mr. H. A. Davis's contrivance these accidents will not only be impossible, but that no damage will be done to the cage or box, so that upon the first accident happening, even supposing the cage or box to be empty, the safety apparatus, if applied, would more than repay itself, besides saving much annoyance and delay in business.



The distinctive portion of the invention is a wedge or wedges, which are suspended at the bottom of the box upon the wood lift guides, *independent* of the box or chain, by a cord, which is connected to the wedges, and passed through a groove in the side of the box, and then led to the top of the guide post, carried over a pulley, and finally connected to the existing balance weight, used as a counterpoise to the box or cage. A recess being cut in the side of the box, a portion of the thin end of the wedge is always introduced between the box and the guide, and by some trifling arrangement the wedge always remains in the same adjusted position. The wedge, as shown in the illustration, is provided with iron lips or flanges to conduct it while the lift is at work upon the wood guide post; it is also provided with iron teeth, which, upon an accident happening, are driven into the wood guide, thus preventing all possibility of it slipping. When a breakage or disconnection of the lift rope or chain occurs, the wedges instantly receive the box or cage, stopping it in a gentle manner, and holding it in perfect safety.

AN IMPROVED ROCK DRILL.—Mr. GEORGE ATKINSON, of San Francisco, has recently patented an improvement in drills, which consists of a novel mode of operating and rotating the drill, and in the manner of constructing the parts of the frame and mechanism so that they can easily be taken apart, or portions detached at will. The device, which the inventor terms a "churn drill," consists of a supporting frame for the mechanism, which is made strong and light, and carries the drill, operating cams, driving shaft, and supplementary shaft. The drill stands vertically, and passes in front of movable cross beams. A lever arm curves around in front of the drill, one end being pivoted to a timber, while the other is held by a spring catch. At the top a cross lever steadies the upper end of the drill, and is held and released in the same manner by a catch. The pivoted end of this lever on one side and the catch on the other side of the frame are mounted on blocks, which are also mounted upon the frame, so that they can be turned to one side, and by this means the drill and its supports can be removed so that access can be had to the drill hole without moving the frame. The driving mechanism of the drill is also mounted on a sliding cross-beam, and a guide which can be moved back for some distance, so as to give additional space. The shaft carries two cams, one being of some size, and serving to lift the drill for each blow. The head of the drill has an adjustable sleeve secured to it loosely, and this sleeve is provided with an arm beneath which the cam rises at each revolution, thus lifting the drill, which is then allowed to fall either by its own weight if sufficient, or a spring or additional weight may be added. One cam is considerably smaller than the other, the office of the smaller one being to turn the drill at each rise for a stroke. In order to do this a plate is fitted to to move up and down the drill shaft, but so as to turn the drill around with itself. This plate has a ratchet cut upon its lower surface, and the smaller cam engages with a tooth of this ratchet at each revolution of the driving shait, thus rotating the drill so as to make a smooth even hole. When the drill is to be worked on a level, the frame will stand firmly, so that the drill may work vertically; but if it is to work at an angle the two front legs of the frame must be elevated, and this would render it inconvenient to turn the crank by which the power is provided. The supplementary shaft is, therefore, mounted at a considerable angle with the driving shaft, and properly supported, so that the crank may be changed from one shaft to the other as convenience may suggest. This drill is a very simple one, and for light work, where steam is not to be used, will be very useful.—*Mining and Scientific Press* (U.S.)

ROTARY PUDLLING FURNACES.—Messrs. JONES, of Middlesborough, have patented some improvements in rotary puddling furnaces. The invention consists—1. In admitting water intermittently to the space between the casings of the furnace (when the furnace is composed of two casings) by various modes or contrivances, one mode being by means of valves or cocks; another method is by means of scoops or bent pipes, or in some cases by a coil of pipes or annular space or duct formed round the outside of the revolving furnace; and another plan by means of buckets arranged at intervals around and attached to the outside of the outer casing.—2. In effecting the egress of the water from the water space of the rotary furnace by means of pipes, channels, or ducts, one or more of which are coiled round the outside of the outer casing, and communicate at one end with the water space.—3. In forming the rings which are secured round the ends of the furnace (and which are divided into two or more segments) with recesses on their outer faces respectively, which recesses fit over corresponding projections on the outer faces of the rings against which the furnace rings revolve, and serve to maintain a tight joint and to prevent the waste of cinder and iron thereat; also in connecting the water-pipes (which are cast in the bodies of the rings) at their external ends outside the furnace with the water space between the casings by means of branch pipes or connecting pipes.—4. In constructing the cast iron or steel end of a single-cased rotary furnace in two or more pieces or segments which are respectively attached to the circular flanged end of the furnace by bolts, and to each other by internal or external flanges and bolts.

NEW SIGNALLING APPARATUS.—Mr. W. LEACH, of Wigan, has prtented an invention which relates to the construction of a signal apparatus for collieries, mines, and other underground works, the object being to combine visible and audible signals from the persons at the bottom of the shaft to the engineer at the pit mouth, such signal remaining visible until the engine has commenced to wind up, and then returning automatically to zero.

CASTING METALS.—Messrs. FARNSWORTH and SANSOM, of Mansfield, has patented some improvements in apparatus used in forming moulds for the casting of metals. According to the invention, the moulding table is formed with a true surface, and is fitted to receive the moulding boxes and the mould plate. The moulding boxes used are fitted with pins on one half and holes in the other, and are all in in duplicate. The patterns are secured to a pattern plate, and are capable of sliding through the mould plate, the forms of the one being exactly the counterpart of the other, so that the sand is prevented from being pulled dowa in the withdrawal of the pattern. The pattern plate is capable of being slid up and down in the framing, and is operated for this purpose by a pinion acting on a rack to the table, such pinion being actuated by ordinary gear and hand wheel or other means.

AXLE BOXES.—Mr. J. A. LONGRIDGE, of Clapham, has patented some improvements in axle boxes for locomotives and other railway vehicles. The invention consists in dispensing with the so-called "rolling brass." Mr. Longridge makes the cheeks or flanges on the axle box in which the axle guides or horns work so as to present two convex surfaces to the axle guides or horns, instead of a parallel groove as hitherto, the narrowest part of the groove being in the centre line of the bearing, and widened out above and below.

HAND PUMPS.—Mr. J. DAVISON, of South Shields, engineer, has patented an invention which relates to the removal of dead centres in crank shafts, and is effected by keying on to a straight longitudinal shaft, supported in journals, a hollow barrel with solid ends. This barrel is divided diagonally and spirally into two portions, and so set apart from each other as to permit a pin to travel to and fro on the shaft and between and along the divided edges of the two portions. Connected to the external end of the pin is an upright arm fixed to the cross-head that works on a centre below the barrel. When the pin is driven to and fro along the shaft by the revolution of the barrel, the pin carries with it the upright arm of the cross-head, causing the some to oscillate, and by that means giving motion to the pump rods attached to the two horizontal arms of the cross-head.

PARIS EXHIBITION, 1867.

VIENNA EXHIBITION, 1873.

LONDON EXHIBITION, 1874.

CORNWALL POLYTECHNIC SOCIETY, 1867 and 1873.

TANGYE BROTHERS AND HOLMAN,

10, LAURENCE POUNTNEY LANE, LONDON, E.C.,

AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO,

FOR

"THE SPECIAL"

DIRECT-ACTING STEAM PUMP.

Upwards of 12,000

OF

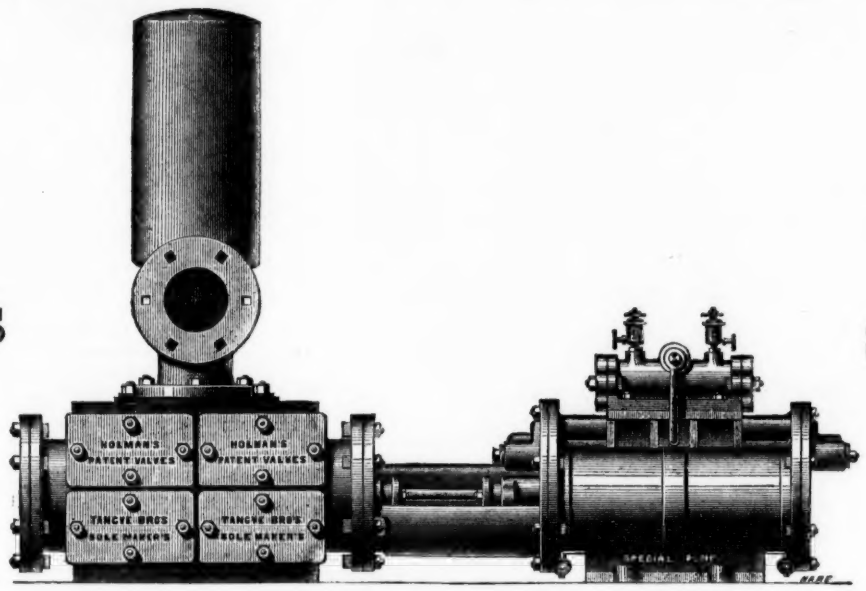
The "Special"

STEAM PUMPS

ARE IN USE IN

ENGLAND

And AMERICA.



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And combinations of

The "Special"

STEAM PUMPS

ARE NOW

MADE FOR EVERY VARIETY

OF PURPOSE.

GREAT REDUCTION IN PRICES.

The following sizes are suitable for low and medium lifts:—

Diameter of Steam Cylinder ...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10
Diameter of Water Cylinder ...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	5	6
Length of Stroke .....In.	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	12	18	24	12	12
Gallons per hour	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,519	5070	7330
Price .....£	16	18	20	25	22 10	27 10	32 10	25	30	35	40	30	35	40	45	50	40	45	50	55	65	50	55	60	70	85	55	60

CONTINUED.

Diameter of Steam Cylinder..In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	16	16	16	16	18	18	18	18
Diameter of Water Cylinder..In.	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14	16
Length of Stroke .....In.	12	18	24	24	18	18	18	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Gallons per hour	9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000	50,000
Price .....£	55	75	90	100	75	80	85	110	120	140	110	120	130	140	160	180	140	150	160	180	200	190	200	220	240	260

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each set of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

The "Special" Steam Pump can be worked by Compressed Air as well as by Steam.

HUNDREDS of these PUMPS are USED for HIGH LIFTS IN MINES, for which purpose they are made with 21, 24, 26, 28, 30, and 32-inch Steam Cylinders, and 36 48 and 72-inch Strokes.

Holman's Patent Self-acting Exhaust Steam Condensers,

FOR ALL KINDS OF STEAM PUMPS AND HIGH-PRESSURE STEAM ENGINES.

TURNS WASTE STEAM INTO GREAT POWER.

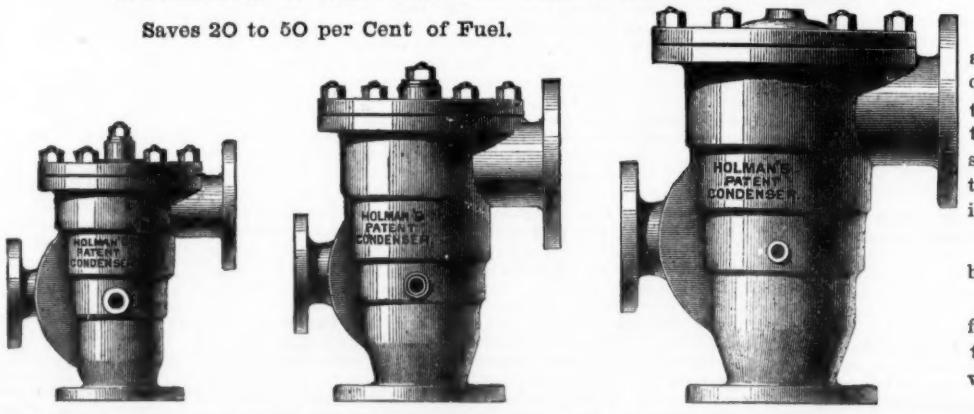
REQUIRES NO THREE-WAY COCKS, CHECK, or REGULATING VALVES.

SAVES HALF ITS COST IN PIPES AND CONNECTIONS.

PREVENTS ALL ESCAPE OF STEAM IN MINES OR ELSEWHERE.

REQUIRES NO EXTRA SPACE.

Saves 20 to 50 per Cent of Fuel.



These Condensers are made to suit any size and kind of Steam Pump. They form a part of the suction pipe of the Pump, and while they effectually condense the exhaust steam, they produce an average vacuum of 10 lbs. per square inch on the steam piston, increasing the duty of the Engine, and effecting a saving in fuel of from 20 to 50 per cent.

In Mining operations these Condensers will be of great value.

All Boiler Feeders are recommended to be fitted with these Condensers, as not only is the exhaust steam utilised in heating the feed water, but is returned with it into the boiler.

The following Testimonial gives one Example of the Power Gained by the action of Holman's Patent Condensers:—

MORLEY COLLIERY, WIGAN, October 16th, 1874.

Messrs. TANGYE BROTHERS AND HOLMAN.

GENTLEMEN,—I have great pleasure in recording my entire satisfaction with the working of the Holman's Patent Steam Pump Condenser which you have supplied to us. The complete condensation of the steam is, apart from its value in the strict economic sense, a most valuable feature in the drainage of underground workings. The perfect manner in which this important result is accomplished by your Condenser is extremely creditable to you, and merits the thanks and commendation of the Mining Engineer. When we start the "Special" Steam Pump the Condenser commences working automatically, and maintains a constant vacuum of 10¾ lbs. per square inch, even when we run the Pump upwards of 80 strokes (166 feet) per minute. It may perhaps be interesting to you to know that when we were running the Pump at 84 strokes (168 feet) per minute, the steam gauge indicating a steam pressure of 36 lbs. per square inch, 80 yards from the Pump, and the Condenser vacuum gauge on the exhaust pipe indicating a steady vacuum of 21½ inches, I turned the exhaust steam from the Condenser into the atmosphere, when the speed at once fell to 44 strokes per minute. The working economy thus shown is really so great that the cost of the Condenser must be saved in a very short time. (Signed) J. THOMPSON.

Price from 30s. to 40s. per inch diameter of Steam Cylinder, according to the relative Diameter of Pump for which Conden er is required.

NORTH OF ENGLAND HOUSE ... ... TANGYE BROTHERS AND RAKE, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.
SOTUH WALES HOUSE ... ... TANGYE BROTHERS AND STEEL, Tredegar Place, NEWPORT, Mon.; and Oxford Buildings, SWANSEA.

Stand 210—Royal of England Show, Taunton, July 12, 13, 14, 15, and 16. To be seen in full operation, five of H. R. M.'s New Patent Stone Breakers and Ore Crushers, one of which will have Engine combined of a new design for working at low pressures; also Portable Engines.

Ore Crushers, with H.R.M.'s New Patent Crushing Jaw.

EXTENSIVELY USED BY MINE OWNERS.

Few Working Parts.
Small Wear and Tear.
Freedom from Breakage.
Simplicity of Construction.
Excellence of Sample.
Economy of Power.

ALSO,

ROAD METAL-MAKING MACHINES,

WITH

H.R.M.'s New Patent Cubing Jaw,

FOR

REDUCING THE MATERIAL

TO

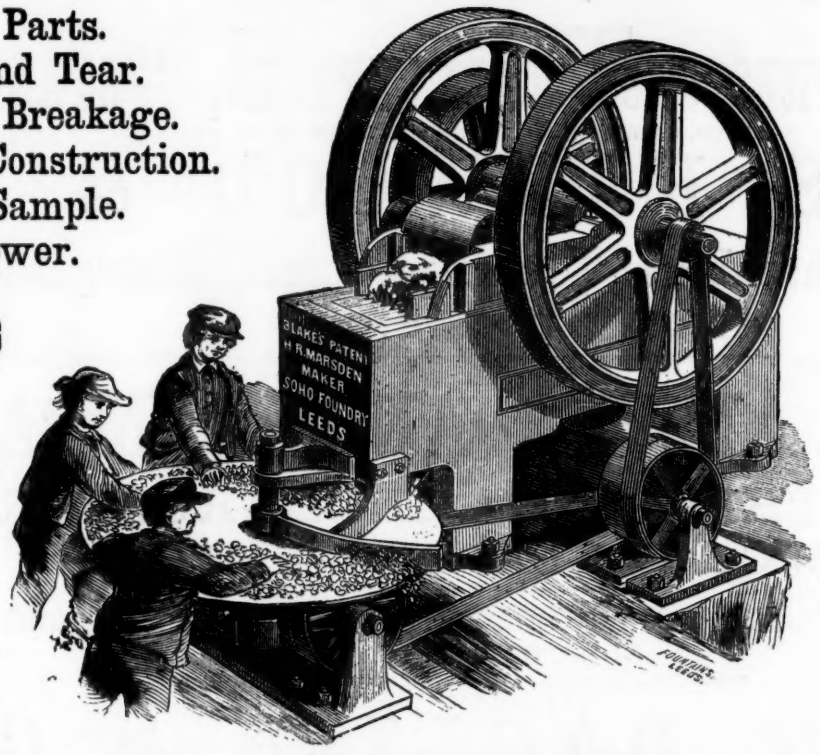
ANY REQUIRED SIZE.

EXCLUSIVELY ADOPTED BY HER MAJESTY'S GOVERNMENT.

H. R. MARSDEN, LEEDS,

ENGINEER,

Immense Saving of Labour.



Mining Improvements Revolving Picking Table.

950 NOW IN USE.

AWARDED 45 GOLD AND SILVER MEDALS

By the PATENT MACHINE

HERE ILLUSTRATED

60 to 70 Tons of Ore

MAY BE

CRUSHED OR SEPARATED

PER DAY OF TEN HOURS.

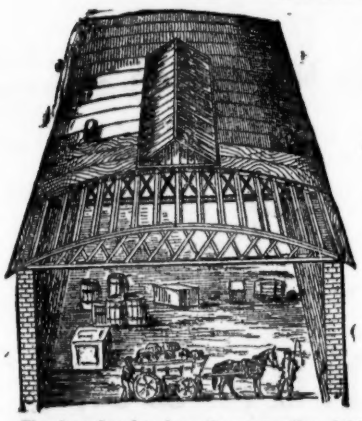
EXTRACT FROM TESTIMONIALS:

"Although I have travelled hundreds of miles for the purpose of, and spent several days in, examining what are styled ORE CRUSHERS, yours only embrace and combine the true principles of action and construction for the purpose designed."

CATALOGUES FREE on application to

H. R. MARSDEN,
Patentee and Sole Maker,
LEEDS.

M'TEAR AND CO.'S CIRCULAR FELT ROOFING,



FOR

GREAT ECONOMY

AND

CLEAR WIDE SPACE.

For particulars, estimates, and plans, address,—

M'TEAR & CO.,

ST. BENET CHAMBERS,

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BELFAST.

The above drawing shows the construction of this cheap and handsome roof, now much used for covering factories, stores, sheds farm buildings, &c., the principal of which are double bow and string girders of best pine timber, sheeted with ½ in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without centre supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.

They can be made with or without top-lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 80s. per square, according to span, size, and situation.

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PATENT ASPHALTE ROOFING FELT, price 1d. per square foot.

Wholesale buyers and exporters allowed liberal discounts.

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By a special method of preparation, this leather is made solid, perfectly close in texture, and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made It may be had of all dealers in leather, and of—

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(WEEKLY), established 1857,

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Manufacturers of

CRANE, INCLINE, AND PIT CHAINS,

Also CHAIN CABLES, ANCHORS, and RIGGING CHAINS, IRON and STEEL SHOVELS, SPADES and FORKS, ANVILS, VICES, SCYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAILS, RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &c., &c.

Crab Winches, Pulley and Snatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptions.

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ARTESIAN BORINGS,

For WATER SUPPLY to TOWNS, LAND IRRIGATION, and MINERAL EXPLORATIONS, may be executed of any diameter, from 6 in. to 36 in., and to any depth to 2000 ft.,

Pistons & Air-pump Buckets fitted with Patent Elastic Metallic Packing

of which upwards of 8684 have been made to March, 1875.

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MAKERS OF LARGE PUMPS AND PUMPING ENGINES.

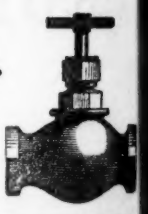
Improved Valves and Taps for Water, Steam, Gas, &c.

PATENT STEAM EARTH-BORING MACHINE

ENGINEERS and MACHINE MAKERS to CALICO PRINTERS, BLEACHERS, DYERS, and FINISHERS.

SALFORD IRONWORKS, MANCHESTER.

PRICES AND PARTICULARS ON APPLICATION.



THOMAS WARDEN & SON,

IRON, STEEL, AND GENERAL MERCHANTS,

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Manufacturers of Anvils, Vices, Hammers, Bellows, Tue Irons, Hydraulic and Screw Jacks, Crabs, Cranes, Spades, Shovels, Picks, Arms and Boxes, Axles, Springs, Hurdles and Fencing, Screw Bolts, Washers, Hames, Chains, Files, Nails, &c., &c.

SECOND-HAND RAILS, AND EVERY DESCRIPTION OF RAILWAY, COLLIERY, AND CONTRACTORS PLANT ALWAYS ON HAND.

CHARLES PRICE AND CO.'S

PATENT RANGOON ENGINE OIL.

THIS OIL is suitable to every kind of Machinery; it is used almost exclusively in Her Majesty's Dockyards and Fleet, and by the War Office and East India Government; as well as by the Royal Mail Steam Packet Co., Pacific Steam Navigation Co., P. and O. Co., Cunard Co., and by most of the other important Royal Mail Steam Fleets in the kingdom It is also extensively employed on the various railways, and by many of the leading engineering and manufacturing firms at home and abroad. "Chemical Laboratory, 7, Printing House-square, Blackfriars, April, 1869.

"I hereby certify that the Rangoon Engine Oil, manufactured by Messrs. Chas. Price and Co., is free from any material which can produce corrosion of the metal work of machinery. It is calculated, indeed, to protect metallic surfaces from oxidation, and, from its peculiar character, is not liable to lead to spontaneous combustion of cotton waste or any similar material which might become imbued with it, as is the case with Rape, Gallipoli, and Olive Oils. The lubricating power of this oil is equal to Sperm or Lard Oil

T. W. KEATES, F.C.S., &c., &c., Consulting Chemist to the Board of Works"

Extract from Mr. BAXTER'S Speech in the House of Commons, May 31st, 1870:—

Chas. Price and Co.'s Rangoon Oil a vastly superior article" (speaking of Gallipoli Oil at £72 per ton)—"was obtained for from £40 to £45 per ton."

Every parcel of the Oil sent from the Works bears the Trade Mark of the Firm, and as many spurious imitations of the Rangoon Engine Oil are sold purchasers are requested to observe that none is genuine which does not bear this mark.

Oil, Tallow, and Colour Merchants, Seed Crushers, Turpentine Distillers, &c.

London: CASTLE BAYNARD, UPPER THAMES STREET, & MILLWALL, POPLAR.—Works: ERITH, KENT

Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors), at their offices, 26, FLEET STREET, E.C. where all communications are requested to be addressed.—June 19, 1875.